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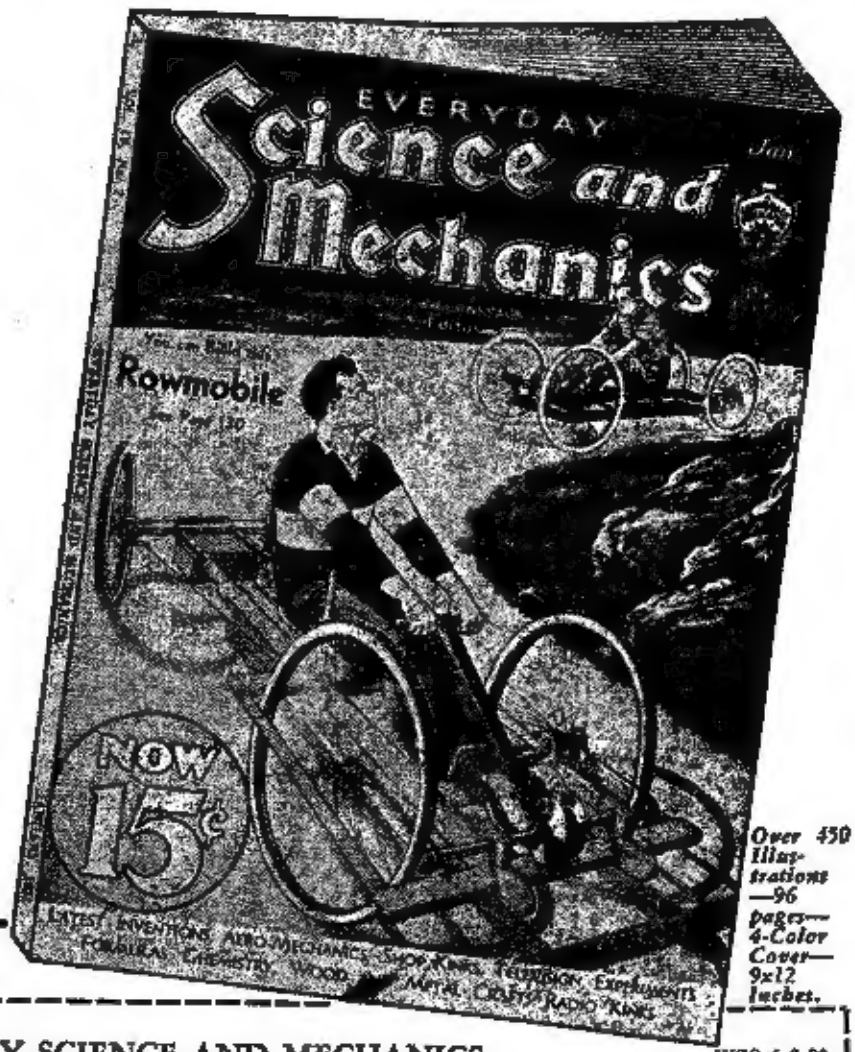

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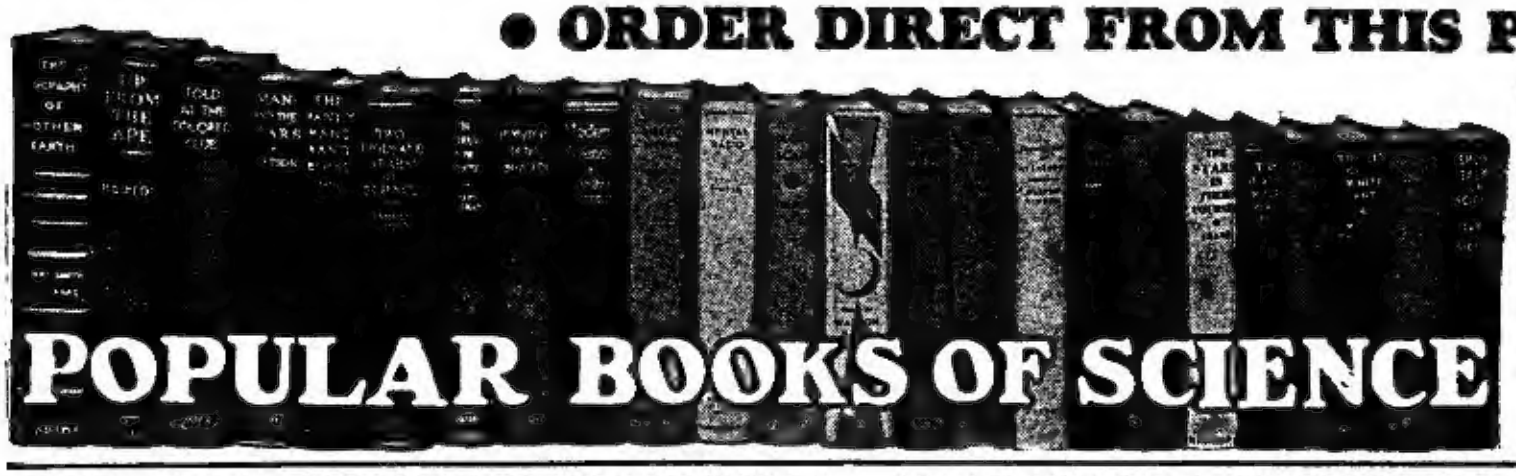

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WONDER Stories Quarterly

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● Frequently, we have received letters from readers of the QUARTERLY urging us to publish in the QUARTERLY reprints of famous science fiction.

Often, the readers send us a list of titles regarding full length novels which they have heard mentioned, with a request that we reprint such and such a book.

The reprint idea has come up often, and we have expressed ourselves frequently in our letters to readers, but, of late, so many letters have been received that I take this means of explaining the position of WONDER STORIES QUARTERLY:

When I first started to publish science fiction in regular magazine form back in 1926, I republished a number of science fiction classics. The selection finally narrowed itself down to only a very few stories, and thereafter practically no reprints of full book length novel were attempted. The reason is very simple. I have, as yet, to see one old time science fiction novel which, in the light of today's advance in science fiction, is readable.

Take, for instance, the majority of Jules Verne's books. Quite a number of them read so tamely today that the average reader would yawn. The incredible wonders in Jules Verne's day are commonplaces today. The same is the case with a number of other older science fiction books. Time has caught up with them, and progress has been such that the authors' predictions have mostly been fulfilled, leaving the present-day reader with a very ordinary story on his hands.

There are, of course, a few notable exceptions. The trouble with these exceptions, however, is that the owners of the copyrights for one reason or another refuse to allow reprinting of the story in a magazine. They perhaps figure that this would hurt the book sale. This obscure reasoning, to our minds, is, of course, foolish, but makes no impression on certain publishers even if they have not sold a single one of their books in ten years.

We have, time and again, ransacked the market for old science fiction books, but so far, we have not been able to find a book which we would enthusiastically reprint in the QUARTERLY.

We think we are pretty well posted on all of the former books, but in the very nature of things, we cannot know all of them. There may be some titles that have escaped us, although it is doubtful.

If you, our reader, come across a genuine volume of science fiction, that can be reprinted today without trying the reader's patience, we shall, of course, be only too glad to know of such a book. We will try and secure the rights for republication, if that is possible.

If, therefore, you know of any such titles, we shall be delighted to hear from you, and take this means to thank you in advance for your cooperation.

The next issue of WONDER STORIES QUARTERLY will be on Sale March 15, 1933

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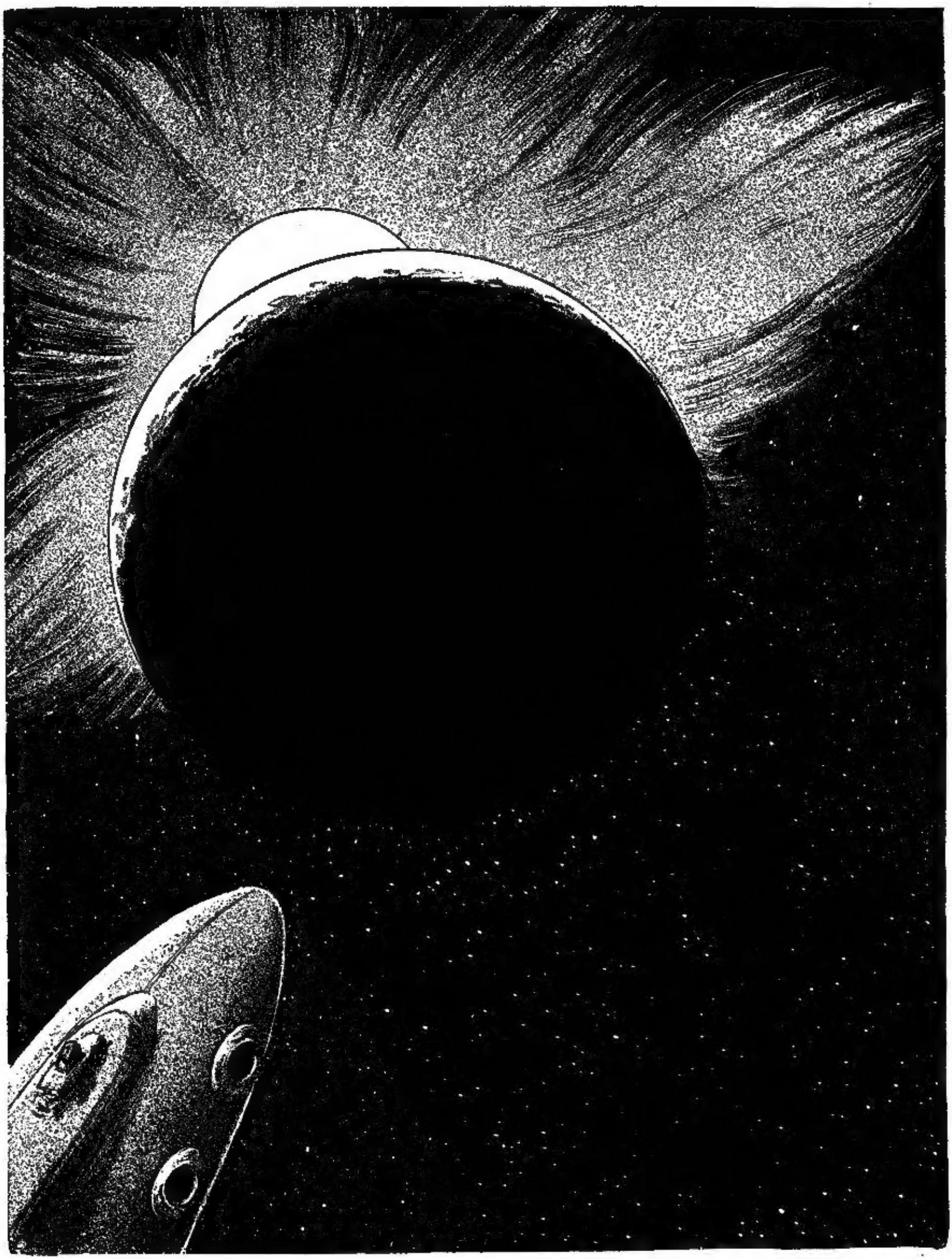

(Illustration by Paul)

A huge dark mass had moved itself in front of the sun, so that only the rim of the sun was left. The mass of Venus stood out in the sky.

INTERPLANETARY BRIDGES

By LUDWIG ANTON

(Translated from the German by Konrad Schmidt)

● Here is the most important interplanetary full book length novel that has appeared for a decade in Germany. WONDER STORIES QUARTERLY has acquired the rights for this classic, and we are certain that the story will make science fiction history.

The author, who has a number of novels to his credit, is a well-known German amateur scientist, and in no instance does he exceed the bounds of plausibility throughout the story.

There is action in every page, and so much that is new and original, yet written with such restraint, that it may well become a model for interplanetary stories.

The story is not only outstanding insofar as space flying is concerned, but the author goes into every conceivable branch of general science in a manner that is nothing less than astonishing.

The average author, as a rule, just builds a space flyer and goes to visit the next planet. This is not reasonable. One does not win an Olympic race before one has learned to run. The author shows with great restraint the difficulties that must be overcome, and what a long and difficult path science must tread before space flying becomes a reality. He shows us every step with classic German thoroughness, leaving out no details where you might trip him up.

An altogether remarkable story, one of the best we have read.

● Six months ago, on the tenth of October, a cablegram came to my home where I was practising medicine in a small Austrian village near Vienna. It was addressed to my niece, Emily, an orphan, who lived with us under my guardianship. The message was post-marked New Orleans and was from Emily's fiancé. It said that he—Captain Karl Lindner, formerly of the German army—would call for her on the twelfth of October at eleven o'clock in the morning to take her with him as his bride.

They were betrothed in 1918, but since the year 1919 Lindner's letters were few and far between. The correspondence of the engaged couple was maintained through the medium of a Rotterdam food export house. Lindner's letters never enlightened us as to where he was staying nor of the means of his livelihood, but he was vehement in assurances of unchanging love and unswerving fidelity. Out of a blue sky he once requested that we send Emily post-haste to Rotterdam where he insisted the marriage should be performed. Emily refused to do this, partly under the influence of my wife who hates hasty and vague arrangements. In her last letter the bride had insistently declared that she would become his wife only before the altar in the old home town. To this letter Lindner had made no answer for four months, and now we were suddenly confronted with that inexplicable cable.

Strange? Yes—very strange indeed! The cablegram was dispatched from New Orleans on the ninth of October. From there Lindner might hope to reach Europe on the fifteenth, at the earliest, by the fast steamer service to Le Havre—the quickest connection existing at that time. From the French coast it would certainly take him at least two more days to reach our home. Was it perhaps a typographical error?

On the next day we had another cable from Lindner. This time it was sent from San Francisco and dated the tenth of October. He repeated his request of the previous day to set the date of the marriage for the twelfth of October and added other requests—to refrain from all festivities, to send out no invitations and not to prepare a wedding breakfast. As a reason, he stated that he was obliged to leave with his wife immediately after the ceremony.

The whole affair became more and more mysterious. We already had aircraft capable of covering the distance from New Orleans to Vienna in three days, but the preposterous assumption of attempting a flight from San Francisco to Vienna in two days,—impossible! There was no motor capable of such miraculous performance; but even if such a motor did exist, how could Lindner announce his time of arrival with almost the precision of a railroad schedule?

The mystery deepened. There was another enigma I could not solve. Lindner's cablegram from San Francisco had been dispatched eleven hours after the one from New Orleans. The crossing from the Mississippi metropolis to San Francisco could not possibly be done in eleven hours.

At any rate I went to our old minister who, despite many formal difficulties, agreed to perform the marriage rite provided the bridegroom arrived at the hour arranged. He, too, doubted the possibility very much.

We showed no concern in our conduct toward Emily and pretended perfect confidence in Lindner's punctual arrival.

On the twelfth we expected his arrival formally attired for the festive occasion. A limousine was waiting before the house to take us to the church. Emily in her hastily prepared bridal gown bustled about in tense excitement, rushing to the window every time she heard the sound of an automobile horn or the rattle of a carriage on the

cobblestones which covered the wide square in front of our house.

At half past ten the tenseness of the situation grew intolerable. Standing behind the curtains of our home I peered intently through field glasses at the occupants of every vehicle that drove toward us.

At ten minutes to eleven I gave the glasses to Emily.

Suddenly the bell rang. Emily dropped the glasses to hurry outside. In the doorway she swayed for a moment and then swooned and dropped into a chair. In the hall stood Lindner. I plied him with questions, but without paying any attention, he hastened to Emily who threw her arms so fiercely about his neck that he could barely keep his equilibrium.

Five minutes later the young couple stood before the altar. This was the exact time that Lindner had stated in his telegram. My wife and I were the only witnesses.

After the ceremony my wife wished to bring the newlyweds back to our home but the young bridegroom only shook his head. "No auntie, Emily will find clothes, lingerie and meals where I am going. I will take care of that. We must leave immediately."

"To the railroad station then?" I suggested.

"No," said Lindner, giving the chauffeur instructions. "Our transportation is awaiting us on the leveled land behind the ruins of the castle."

● We got into the car, traversing the length of the village in rapid time, arriving presently at the foot of the hill on the summit of which was the ruined castle. We mounted the hill on foot. After we had gone around the wall of the old castle and reached the level land behind it, I felt my wife tugging at my arm.

Before us lay a colossal, fish-shaped monster, about thirty yards long, grayish green as though tarnished, sharply pointed at the bow and equipped at the stern with a huge two-bladed steel propeller. On the sides we could count four windows. In the center of the roof there was a conning tower; a port swung open as we approached and a hempen ladder about six yards long was lowered to the ground.

The farewells between the two women were brief but full of feeling. Emily mounted the ladder, Lindner following close behind. The port closed after them, and silently, without any noise even from the propeller, the monstrous vehicle arose almost vertically upward and after a few seconds had disappeared completely from view.

During the days following their departure, we anxiously awaited news from our ward. For six months we heard nothing from either of them. Then three letters arrived almost simultaneously. One of them bore the postmark, Batavia in Java. In this letter Emily referred to earlier letters and mentioned in vague terms a very interesting journey. Another came from Mexico in which she said that she was very happy, with laudations of her husband's tenderness. The third letter was from Buenos Aires.

I did not know what to make of it.

About a month ago I received another letter, this time from Lindner and postmarked Syracuse. The letter was accompanied by a check for $500,000. In his letter Lindner ordered a number of various articles, among them being agricultural implements, furniture, and divers optical precision instruments, also several carloads of electric bulbs, a thousand dozen steel springs, surgical instruments and various kinds of tools.

With each order he indicated the firm from whom it could be procured. The whole order would be about eighty carloards. He instructed me to have all these goods ready for shipment at the freight station on the fifteenth of this month at ten o'clock in the morning. He said that at that time he would be present to accept the merchandise. The letter bore a line written by Emily, "The best of wishes and *auf Wiedersehen.*"

I committed the execution of the purchase of all these articles to an agent, who kept me on tenter hooks by insisting that the whole thing was beyond his capacity. However, the last five carloads arrived at exactly a quarter to ten, on the fifteenth. The station master cursed me for tying up the line with so many cars and declared emphatically that at a quarter to eleven he would have the whole shipment shunted to Vienna. The Matzleinsdorfer freight station, he said, was amply equipped to handle such a huge shipment, but not his station.

For an hour and a half, my wife and I had been standing on the draughty platform of the railroad station, arguing first with the agent and then with the station master. We took frequent glances at the sky, alert for the appearance of our friend. At about five minutes to ten, I noticed at a considerable altitude an airplane larger in size than I had ever seen before. In shape it resembled Lindner's smaller machine, but was larger than the greatest ocean liner. Judging by the rows of windows, it was at least eight stories high, and no less than five hundred yards long. Propellers on the top, at the sides, and at the rear, could scarcely be counted.

Very slowly it descended over a field a mile wide, close to the railroad station. Hundreds of people emerged from its many doors. A group of them blocked the road with barbed wire entanglements. A second group blocked the road on the other side of the railroad tracks, despite the vociferous protests of the station master. In great haste, all the rest of the passengers unloaded carload upon carload of the goods stored in the railroad cars and reloaded it in the huge ship with the aid of many small trucks. In less than five minutes after the landing of the ship, the areaway of the station had been transformed into a veritable anthill of activity. In its center stood two men, shouting, gesticulating, and giving commands.

One of them, who was tall, swarthy, with a profile like Caesar's, seemed to be the chief of all the operations. His orders were terse and given with an air of finality. The other was a smaller man, and more excitable in his manner. He did less commanding and was less persuasive and convincing than the chief. The former was unknown to me, but I recognized the latter as the erstwhile Prussian officer, Otto Taussig, a friend of Lindner's. I had made his acquaintance at the front and admired him greatly for his sense of honor and cleverness. Then Lindner approached us, arm in arm with Emily. Emily hurried to my wife while Lindner shook hands with me.

"But tell me," I began, "what is this all about? Where have you come from and where are you going?"

Lindner handed me an official looking envelope which bulged with papers. "This will answer all your questions. If I were to answer them, I would never reach an end. Moreover, you probably would not believe me."

"I don't understand you."

● Lindner watched his hard working mates for awhile.

"When more than four hundred years ago, Pizzaro or Cortez had answered a similar question by saying, 'I am going forth to conquer new worlds',—were not both of them right? Thus we say, 'We are going forth to conquer new worlds.'"

"New worlds?" I questioned in surprise.

Lindner smiled.

"After you have read these pages, you will understand all. We are a small army. Just a few thousand men and women. Many more thousands merely await the word to follow us. We have chosen a path more dangerous than the one Columbus took. We do not even know whether we will reach the land of our destination or not. Four of us have already been there; Taussig, Martin, Meixner, and I. If we arrive safely, we shall communicate with our followers. The whole world will receive our wireless message but will not know where it came from nor what it will mean. Only our followers, the New Germans, will be able to decipher it. They are the ones who have kept the faith with Germany, the old Germany of the West and the new German Empire which we shall build."

A sound struck my ear. It was very familiar to me, though I had not heard such a sound for a long time. It was gunfire. Then someone waved a white flag. The firing stopped. An Austrian state trooper appeared among the busily engaged group. The stranger, whom Lindner pointed out to me as Martin, approached the trooper very excitedly.

"What is the idea of firing at my men?"

"Why are you occupying station territory with armed troops?"

"Because your station master wants to prevent me from unloading legitimately purchased goods, and also because this bureaucratic flathead is threatening to move the whole shipment out of his station."

Taussig joined the excited discussion.

"I'll fix this fellow, Martin," he said, "I'll keep him talking until you have unloaded everything."

The irate station master presently turned to the trooper, who, after a short discussion, demanded the immediate evacuation of the territory.

"But certainly you can't force us to do that," remarked Taussig very calmly, "all these people are excellently trained front line troops who could do away with your thirty men in less than ten minutes. Let us work here undisturbed for another twenty minutes, and we will leave of our own accord. Not even the extremely charming manners of your station master could detain us for a moment longer than that."

"I doubt very much that you will be able to go," remarked the station master sarcastically, "I have already telephoned to Vienna for help. Two companies of National Guards are already on their way here."

Taussig shrugged his shoulders and turned to the state trooper.

"You seem familiar to me. Yes, I remember you. It was on the Tagliamente. I was in charge of a battery. I had been put in command after all the other higher officers had been killed. You were commanding a company of Austrian Infantry which had been detailed to us as reinforcements. We had been advanced very far, and were, therefore, in the hottest part of the battle. But we had a lot of fun anyway."

The two men became deeply absorbed in wartime memories.

Lindner could not repress a smile.

"That takes care of the state troopers. There is no one like Taussig for handling affairs like this."

The station master grinned sardonically.

"But what about the National Guard?" he remarked to Lindner. As he said this, he handed a pack of papers to Lindner, which the latter turned over to Martin.

Martin shrugged his shoulders. "Well, I guess they will step easy too."

"Not this time!" retorted the official heatedly, "I've telephoned the reparation commission of the former Air Ministry that an airplane of unknown origin has arrived here. That means that it will be confiscated. As you know, the St. Germain Peace Treaty provides—."

"Walter! Maier!" shouted Martin.

Two heavily armed men approached.

● "You take this gentleman between you," said Martin.

Then addressing the station master, he threatened him, "If you speak another word to anyone except me, you'll find a piece of cold steel between your ribs, you cad! You're lucky that the Entente didn't retaliate, otherwise you'd be swinging from this lamp post now. By the way, I'm still short a bill of lading for twelve carloads. Get them right away. You two," speaking to the two guards, "go with him. At his first attempt to speak a word to anyone, give him the works."

Greatly annoyed, Lindner turned away from the group.

"Would you think it possible,—an Austrian official denouncing German citizens to the Entente for a violation of a provision of the shameful Treaty of St. Germain?"

I abandoned the subject.

"When shall I see you again?" I asked him.

"Never again in my life, I'm afraid," Lindner answered.

"I am very sorry, for you have always proved a reliable friend to my wife and to me."

A car stopped abruptly on the street, hailed by Martin's sentinels. Three Entente officials descended from it. We saw them gesticulating in excitement, but could not catch a word of what was being said.

"Have the gentlemen come up here," ordered Martin. "At least I can tell them that the Vienna government is entirely innocent in this affair. Otherwise, the poor Viennese might have to starve and freeze for a week."

"In the name of the Austrian Commission of Reparations, I confiscate your ship," said the first of the men, an English officer, in an authoritative way. "Where did this vehicle come from?"

Martin laughed. "Directly from China," he said in English. "Tell me, Colonel, why are you so scared of this harmless craft?"

"To what country do you belong?" inquired the French officer.

"To none. I am personally responsible for all that is going on here. I myself have occupied by armed force this region, I myself am holding this venerable railroad employe as a captive. No government on earth knows of me or of my existence."

He went over to the landing place with the foreign officers.

Lindner laughed. "Martin is in his element now. Note how these gentlemen become alternately flushed and pale.

It is his favorite pastime to encounter official representatives of a former enemy power, for he knows of nothing better than to tell them unpleasant truths, a thing which scarcely anyone else dares to do nowadays in Central Europe."

"Gentlemen!" he was interrupted by Taussig, "you are in my way. If you aren't working here, ——!"

We went toward the ship where Martin was still engaged in conversation with the Entente officers. The activity along the tracks had lessened. At the same time, Martin was given the report that the loading had been completed.

"Let's go then, gentlemen," said the latter, "we'll evacuate the station territory."

Presently the noise of drums, and the step of marching columns became audible, and then died away in the distance. In no time, the station area was deserted. Lindner, his wife, and his crew, disappeared quickly within the ship. The barbed wire entanglements were gone. From two sides, the curious natives, with my wife and I in their midst, pushed their way to the ship. Along the tracks was marching a company of National Guards. In one of the conning towers of the ship stood Lindner, still talking to the English officer. What he said was lost to me in the clamor of the ship's impending departure.

And then all the windows of the airship were flung open. There was a sudden silence, and from the interior rang out the iron "*Die Wacht Am Rhein.*"

The spectacle-hungry crowd and the National Guard joined in the lusty singing.

Then, as if leaping, the mighty ship sprang into the air. It all took place so quickly, we could not even see the windows being closed. Each succeeding second, the ship grew smaller, and then vanished completely in the distance as it dropped below the horizon in a southwesterly direction.

I left Lindner's portfolio of papers with a colleague of mine, and then waited. I fully expected to be questioned and cross-examined by some officer of the law, for after all, I had undertaken the ordering of the merchandise. But nothing of the sort occurred, and curiously enough, not even the newspapers carried accounts of the strange airship. These facts convinced me that perhaps the Entente official meant to silence the affair.

Then I took Lindner's stenographic notes to my home and set out painstakingly to work my way through them. What I found in them was so extraordinary, that I decided to reveal their contents to the public from a standpoint of a very general scientific interest. The abundance of new, unheard-of facts meant such a deepening and enriching of general human knowledge, that it would have been a crime to remain silent about them. But this was not the only reason. What my friend, Lindner, had bequeathed as a last gift was especially instructive for us Germans. It showed very clearly that we were wrong in despairing of these days of hardship. Our future lies not, as William II had said, "on the water," but in our shops, in our laboratories, in our heads and fists, and in our unchanging and passionate determination to remain German amongst all nations and conditions.

The following book is a report of the beginnings of a great undertaking. It tells of a group of our death-defying countrymen, who, for their Fatherland's sake, exiled themselves forever from their home. But even though their undertaking may prove a failure, their noble example will not be swallowed in oblivion. Henceforth these lines shall preserve it for future generations.

I have felt a need to transcribe Lindner's many notes into a coherent, systematic report of an impersonal nature. For other reasons too, a rearrangement of his memoranda seemed to be necessary. Only the very last sheet of Lindner's notes have I offered, word for word, as a most appropriate *finis* for this strange account.

CHAPTER II
A Discovery!

● Revolution in Berlin. Barricades which are broken by trucks manned with grenade squads. Machine guns in the windows. Dark nights illumined by the flames of burning houses. Business establishments seised by the community. Hurrying humanity on the streets, huddling close to the fronts of buildings. Flying ambulances. Government troops, Communist groups, Citizens' League for Preservation of Order.

CHAOS!

The War Ministry stands like a house built on a rock, defying the stormy onslaught of revolution. In it one man tries to unite Germans of all parties for the salvation of the Fatherland. A man who attempts to avert catastrophe. He is the republican socialist War Minister. He is the leader of theproletariat. For this reason he has been called, "the Bloodhound."

The storm has almost subsided, although there still exists a terror-stricken atmosphere.

We enter the office of the War Minister who is examining a heap of documents. Before him are standing three men. The receptionist stands attentively at the door.

The War Minister is turning to one of his three visitors.

"You are the Prussian captain, Karl Lindner, from Kattowitz in Silesia. Technical officer in the Artillery, specializing in chemisty. You remained on the front until 1918, after having been wounded twice. You were then placed in charge of an army chemical laboratory in Berlin, where you have been ever since, except for an official trip to Austria."

Lindner stood at attention.

"That is correct, your Excellency."

The minister then turned to the second of his visitors; a stocky, clean shaven man about thirty years old.

"You are Dr. Fritz Meixner from Kustrin. Royal Army physician, active until the beginning of 1918, alternately as front and hospital surgeon. You were then attached to the Berlin Charité as a pathologist. Your specialty was comparative anatomy and microscopic chemistry. You have thought of affiliating yourself with one of the universities of the city in the field of comparative anatomy? Am I correctly informed, Doctor?"

"Precisely, your Excellency."

"Now, about you?" the minister said as he turned to the last of his visitors, at the same time reaching for a sheet of notes. "You are Otto Taussig Ph.D., from Koenigsberg. You specialize in physics and higher mathematics. For purposes of becoming established, you published, in 1917, a much noted treatise on the errors in calculating the orbits of projectiles as observed by you on the front. Your pre-war work has dealt chiefly with astronomical subjects. After your service at the front, and until 1918, you were attached to Captain Lindner's laboratory. Right?"

"Yes, your Excellency."

● "Well, then, in the files of the War Ministry I find a petition of Capt. Lindner dated Oct. 16, addressed to my immediate predecessor. In this petition, you, Capt. Lindner, asked for yourself and the Doctors, Meixner and Taussig, an audience to communicate confidentially with me upon a number of highly significant scientific facts, hitherto unknown. These facts, you claim, are likely to cause a thorough revolution in the technique of warfare. The document reached me as late as the 30th of October after the usual official routine.

"As my predecessor has been prevented from taking care of this matter, because of subsequent developments, I have asked you to appear before me. I am asking you now, Do you, in view of the political changes that have since occurred in the situation of the world, still think your invention or discovery has timely significance?"

"We do, your Excellency," said Lindner.

"Very well then, proceed."

Taussig spoke first.

"By way of introduction, may I call your Excellency's attention to the fact that the explanations and demonstrations indispensable to the understanding of our proposals will require about two hours."

The minister deliberated a moment, consulting his watch.

"I can devote an hour and a half to you. Do you need anything for your demonstration?"

"We have brought everything with us," said Lindner, pointing to a large portable case. "All I should like to ask for is a large bucket of water."

The minister gave his attendant an order. He disappeared immediately.

Lindner opened the case.

"At the beginning of 1918, Dr. Meixner came to our laboratory, bringing with him a small chest filled with a kind of heavy, green sand. This, your Excellency, is a sample of that sand. I am very familiar with all kinds of minerals, but I had never seen this kind of sand before. Meixner had found it on a hill at his father's estate. I began immediately to attack the problem with all the means chemistry afforded, and I have made the following findings:

"The sand represents a metal oxide, that is to say, a chemical compound of oxygen with a metal thus far unknown to science. We chose to call this metal, *varium*. Its oxide is insoluble in any acid, as well as in any base. At a temperature of 210 degrees Centigrade, the oxygen is liberated. Varium has a hardness of 5½ Mohs' degrees, a melting point at 240 degrees Centigrade, its specific gravity is 2½, and its spectroscopic reaction resembles that of sodium."

"Your Excellency will remember," said Taussig, "that in 1910 a comet approached the earth. At that time, there was great excitement about it in the newspapers because our planet was passing through the tail of the comet. It was in this tail that I found a spectral line between *d* and *e*, a line which reappears in the spectral band of varium. I have seen this line nowhere else."

Meixner had his eyes fixed upon the War Minister, whose features portrayed startled bafflement. Then a door swung open. Two soldiers brought in a bucket of water and placed it on the floor. They stood at attention for a moment and then disappeared.

Lindner took a spirit lamp from the case, also a platinum crucible. He poured some green sand into the crucible and held it over the lighted lamp. Meanwhile Taussig took a glass bell from the case. The bell had an opening in it several inches wide, located on the side. He also produced a static machine.

The sand in the crucible grew gray in color. A scum formed on the top of the melting substance. The grains of sand finally united into a lead-like material which appeared dull at first and finally as bright as a silvery mirror. Then Lindner took the crucible with a pair of tongs and immersed it for several minutes in cold water. He then removed the crucible and turned it upside down over the table.

"This is pure metallic varium," explained Lindner. Meixner took the glass bell and placed it over the metal. Then Taussig put the static machine beside the bell and began to operate it. A low, crackling sound indicated the generation of a static charge. Suddenly, with a louder sound, a spark as large as a small coin leaped through the hole in the bell to the varium inside.

"Astounding!" the minister said, staring open mouthed at the ceiling. Hit by the spark, the lump of varium had leaped to the top of the bell where it paused for a second, then with a rocking sort of motion, the bell slowly rose into the air, finally reaching the ceiling, where it remained like a balloon. The strange metal was still in the top of the bell.

● Taussig then took a rubber glove from his bag and put it on his right hand. He stood on a chair to retrieve the bell and metal, laying it then upon the table as he decharged it of its static current. The minister had by then recovered somewhat from his amazement and was approaching the table to examine the metal more closely.

"Don't touch it," Meixner quickly cautioned him. "It has an immense affinity for oxygen and will withdraw it from any matter with which it comes into contact. It causes frightful burns on the flesh."

Taussig produced a ten-inch cube and a scale and weights.

"This is a wood-encased piece of varium. This button on top is connected with the varium inside. It is made of pure gold. On the opposite side is a hook by which the block is hung upon the scales. The object weighs 5,800 grams, as you can see. Now I am charging negative,—. You see now that it takes 9,300 grams to balance the apparatus. With a positive charge, it would rise as the varium in the bell rose. If I add 3,500 grams, it will remain suspended anywhere in the air."

"Amazing!" exclaimed the minister. He asked them to repeat the experiment. "How did you happen to make this miraculous discovery?"

"Quite accidentally. Taussig was experimenting with one of his static machines and a spark of positive charge happened to hit the first piece of pure varium that I had succeeded in isolating."

"How long ago was that?"

"About a year ago."

"About a year ago?" repeated the minister questioningly. "It took you a year to find your way to the War Ministry, you three German officers who made such a startling discovery during the war which determined Germany's existence or annihilation."

"I can hardly express how grateful we are for your words and the attitude evident in them," said Lindner, "but it was impossible to come any earlier. We had not

progressed to a point of making a practical application of our discovery."

"Just what do you mean by that?"

"We mean that varium is very unstable and will disintegrate very rapidly. Tomorrow only half of this piece will be left, and in two or three days it will probably vanish entirely."

"Why do you not seal it hermetically?"

"In what?"

"How do I know? In glass, for instance?"

"We have tried that," answered Taussig. He produced a glass ampule which was sealed at the top. The glass was lined with a network of cracks and contained some of the green sand.

"I have filled such an ampule half full with liquid varium. I then heated it, which caused it to expand quite rapidly. At that point I sealed the glass," explained Lindner. "The subsequent contraction of the metal caused by the cooling, created a vacuum. After two days the ampule collapsed. I found bits of glass and grains of gray and green sand. I separated these three substances and analyzed the gray sand. It proved to consist of potassium, calcium, a trace of lead, and the component elements of glass."

"What about using metal containers?" inquired the minister.

"We poured molten varium into a can made of thin iron. We soldered the opening shut. We then determined its lifting power. Oxidation, that is, the transformation again into sand would necessarily indicate itself in a decrease of lifting power, because the oxide is not varioactive. It does not change its weight. The lifting power decreased from day to day and was completely gone after a week. After opening the can, we found it filled with green sand. The surface of the can inside was bright, but after exposure to air quickly acquired a coat of rust," Lindner explained at length.

"Can you explain that?"

"Yes. We repeated the experiment with the same result, and then prepared a piece of the iron surface for examination under the microscope. Through the microscope, then, we found that the iron was filled with tiny air bubbles. As long as any of the varium was not saturated with oxygen, the iron could not rust."

"Have you finally succeeded in checking the oxygen affinity of varium?" asked the minister.

"Yes, after eleven months of hard work, mostly conducted at night, as we were fully occupied in military service during the day. We are now able to make antigravity elements. This is one of them. This one is capable of lifting itself and seven times its own weight. With a negative charge, its own weight increases five times. We have also discovered that varium can render other matter varioactive."

"Will you please tell me now what your ideas are about the utility of these things you have just explained," said the minister.

● Taussig brought forth a portfolio from his bag.

"Having made our discovery while engaged in war service, we naturally thought first of utilizing our discovery in warfare. These are the plans and diagrams of a vessel which could at one time have served as a submarine and as a dirigible."

The minister examined the drafts with interest and followed Taussig's explanations with keenest curiosity. He pointed out the lack of room for the storage of fuel.

"No need for that."

"Why not? What sort of motors could you use?"

"A varium motor, your Excellency."

"And what is a varium motor?"

"This schematic draft will explain its principle to you.

"Imagine a wheel with four spokes, with varium encased within them in glass or ebonite. Each spoke has a metal contact which connects with the varium. About the circumference of the wheel are arranged four brushes which are connected to the static generator. Two of them are positive and negative respectively, and the other two are grounded and take care of the decharging. The wheel is normally in balance. If a positive charge is applied on one side and a negative on the other, the weight of one spoke will decrease and the weight of the other will increase, and a turn in the direction of the negative charge will result.

"As a negative spoke comes to the bottom, it will be decharged by the grounded brush, and coming up again will receive a positive charge. The originally positive spoke has meanwhile arrived at the negative brush and receives a negative charge. Its former loss of weight will not only be offset, but its weight will be increased. After another turn of 90 degrees, it will be decharged by the grounded brush and the cycle will then begin all over again."

"That is very clear to me," responded the minister.

"Regarding its power, I would like to mention that a three pound model will give one horsepower. One-thirtieth of the output is sufficient to keep the generator going."

"But aren't you defying all the laws of nature?" queried the minister. "You claim to have accomplished the *perpetuum mobile*."

"Oh!" exclaimed Taussig, "could I have been mistaken in not thinking you an expert? It is not the one-thirtieth horsepower that does all the work; it is the earth's gravity which we are utilizing. Nobody seems amazed over waterpower generating electric current through the use of a turbine, but that arrangement is not different from this."

The minister shook his head.

"Still I can't understand it."

"But that a body, when electrically charged, acquires a lifting power of seven times its own weight—."

"Yes, I have seen that."

"And that a body, loaded with seven times its own weight, can remain suspended in the air—!"

"Although I have not seen that with my own eyes, that too seems plausible to me."

"Well, my motor, whose principles your Excellency questions, is nothing but an application of this principle of varioactivity. As you can see in this model, it will keep going forever if I don't stop it."

"But do stop the weird device, please. In its silent operation, it makes me feel strange. Now tell me for what your varium motor can be used."

"Practically for any purpose. In locomotives, ships, for generating current, in building houses; it will dispense with hydro-electric power works, make us independent of the use of coal, in other words, do anything that is now being done with human labor, provided, of

course, we can find enough varium in the world."

The minister stroked his forehead.

"Where does it occur, and how much have you already obtained?"

"During the past year we have made an intensive search for the mineral under the auspices of the German Army Headquarters. Then, there are the few cases also which we found on the estate of Meixner's father. We found deposits in the region of the Red Sea and also at Odessa. The staff at headquarters have obtained and sent to us all the green sand that they could find."

"And how much is that?"

"Two hundred carloads. It is stored in sacks on an estate in the suburbs of Berlin."

CHAPTER III

A Mysterious Visitor

● The statesman arose from his seat.

"You may replace your apparatus in your case. And now, please tell me about your proposal."

Lindner looked up in astonishment while Taussig began to speak:

"We are offering our discovery to the German Government for the reconstruction of our country. We offer it for peacetime use, and if necessary, for war use as well."

"Too late, too late, but perhaps too early," replied the minister. "Today we are surrounded by spies and a horde of cruel and greedy enemies. I shall destroy all traces of your reports in the official files so that no one shall purloin your secrets. However, I do not know when I shall be able to protect you from inquisitive persons. The manufacturing of new war implements is an impossibility in Germany today. As you know, we are compelled to give over all our old war material, and as for the industrial utilization of the invention—?

"Do you believe for a moment that we could protect our rights on it? England would build battleships with it; the French would construct combat airships, and the Americans would build bigger and better factories. We would be the losers."

(Illustration by Paul)

The ball slowly rose into the air finally reaching the ceiling where it remained like a balloon.

"Is this your official reply, your Excellency?"

"No, it is not. Have you finished packing your things? Are you certain that you have forgotten nothing? Not a single small part that might be a clue to your secret?"

"Absolutely not, your Excellency."

The minister rang for the attendant. "Who is in the antechamber?" he asked him.

"Mr. Martin, your Excellency."

"Very well. Ask him to wait another moment. Have the major come in."

The confidential adviser to the minister stepped briskly into the room.

"Gentlemen," said the statesman in a brusque, official tone, "I hope that you realize that you have taken up my time unnecessarily with your complaints and suggestions, Lieutenant Taussig, I am not a party member here, but merely an official of the government. The things submitted by you do not fall within my jurisdiction. Please refer your requests and complaints to the secretary of the regional organization to which you belong. Gentlemen, I am sorry but my time is limited."

The three officers stood at attention for a moment. Taussig and Meixner picked up the bags and the group proceeded to their waiting automobile at the gate.

"I did not know that you were a party member," Meixner said to Taussig.

"Nor did I, but nowadays everybody is as good as a party member, and the minister probably thought—"

"But what is going to happen now?" questioned Lindner.

"Now? Why, we'll be arrested."

"Are you mad?"

"I have never done more sober thinking than I am doing right at this moment."

"What do you mean?"

"By rights, the minister should not have allowed us to leave his house. In London, Paris, or Rome, our arrest would most certainly have followed our interview. See, that is the trouble with German statesmen. They never grasp an opportunity They are too decent. If they weren't, they would have won the war"

"But why should they wish to arrest us?"

"Because we are in possession of a very deadly weapon."

"But didn't we offer it to him, and didn't he refuse to accept it?"

"He could not accept it."

"What do you conclude from all this?"

"If he were a Richelieu, a Mazarin, in short, a tricky man, a man who ruthlessly pursues his own interests, he would probably make us go to some isolated spot in Germany and manufacture secretly a great supply of varium machines. When the time was ripe he would come forth with his mighty weapon and would make Germany, rise to a new level of glory. But he does not know who will hold the reins of power when he will be forced to resign, today, maybe tomorrow, any day He may be a narrow minded, single track, party politician, or a traitor bribed by the enemies—. In short, the idea is impossible."

"Go on, go on."

"Another way would be to silence us—do away with us. Human life is cheap in these times, and 'dead men tell no tales.' As a matter of fact, it would even be his duty to do that."

"That sounds more and more encouraging. If you could see all that beforehand—."

"I did see it."

"Then why in heaven's name did you go to see him?"

"Simply because we were ordered to do it. We are still German officers and not yet discharged from the army."

● "I do not believe," said Lindner, "that our lives are threatened by the German War Minister."

"Nor do I," cut in Meixner.

"I hardly think so either," joined Taussig, "but you remember his saying that he might not be able to protect us from being molested. With the well-organized espionage system of the Entente, we must be prepared to be arrested at any moment, whether by German or Entente officers."

"I can't see why."

"Well, in any case he will want to know whether we are tight-mouthed and won't sell our invention to England or France, for instance, who would value it at many billions."

The car had stopped. Quietly they carried the bags to the laboratory on the third floor. After removing their coats, they continued their discussion.

"You think then," began Lindner, "that they will arrest us?"

"Yes, and today, too."

"Well, we already know what to say."

Taussig smiled. "I certainly don't."

"You don't?"

"Tell Meixner and me what to say, Lindner. If we have trouble with Entente officers, real or fake ones, we must not contradict each other's statements."

"Well, we will withhold all information."

"Suppose they should ask us why we went to see the minister?"

"We'll be silent about that too."

Taussig nodded and seated himself at the table. A small cabinet a half yard high stood before him. A device like a periscope projected from its top. He turned the switch on the cabinet and observed a screen like that used in television.

"What's this?" he asked in astonishment. "A troop of four English marines under the command of a sergeant. They certainly are quick. That means us, no doubt. But no, I must be mistaken. I don't think they will arrest us yet." Still speaking, he arose from his seat, removed the receiver from the table and placed it in its case.

"What are you talking about?" interrogated Lindner, growing a shade pale. "English marines in front of the house?"

"That was where they were a moment ago. They are inside now."

"So far I have placed little credence in your talk of arrest, but with English soldiers around, I guess I'll have to—. Yet you say there is no danger. Why isn't there?"

"You will see for yourself in a moment. Here they are."

There was a rap at the door. A sergeant entered the room.

"Capt. Lindner, Dr. Meixner, and Dr. Taussig?" he asked in an accent distinctly English.

"Yes," confirmed Lindner, a trifle excited.

"Gentlemen, I must ask you to follow me," said the stranger.

Lindner stepped forward, but Taussig remained seated and retained his composure.

"I have not the slightest intention," he said. "I have more work to do just at the moment."

"Gentlemen," said the officer, opening the door wide enough to reveal the soldiers standing in the vestibule, "I should deeply regret being obliged to use force."

"Entirely unnecessary," spoke Taussig calmly. "The

whole comedy is superfluous. You just run downstairs and tell Mr. Martin we would be glad to have him up here with us."

"I'll be d——," swore the sergeant, suddenly losing all of his English accent. "This is the height of insolence. So you are going to wait here."

"Yes. Go down and get Mr. Martin."

The pseudo-Englishman left the room, shaking his head in exasperation.

"I recognized Mr. Martin through the periscope," explained Taussig.

"And who is Mr. Martin?"

"I haven't the faintest idea, but you remember that he was announced to the minister, and the minister seemed anxious to see him. I took a good look at the man and recognized him instantly in the car filled with marines. The whole scheme is clear to me now."

He arose, getting a portable stove, a pan, and other accoutrements, to prepare some eggs for lunch. Then the door opened and a tall, broad-shouldered man dressed in traveling attire, entered the room.

"Good morning, gentlemen, here I am." He had a clean shaven face, a straight, prominent nose, pronounced cheek bones, piercing gray eyes, and the features and characteristics of one accustomed to quick action and obedience from his inferiors.

"Be seated, please," invited Taussig, "you will excuse us while we have lunch. We are very hungry. You are welcome to join us."

● "Thank you for your invitation, but I have already eaten. I would accept a glass of wine though, if you don't mind."

"Meixner, will you pour a glass of wine; I must watch the eggs. Well, that's that. You'll excuse us; we will hurry through our lunch."

"If you gentlemen don't mind, we can talk while you are eating."

"Very well," agreed Taussig, "but I am afraid that you will have to do the greater part of the talking."

"Here is to your health, gentlemen. As you probably know, I am an American by choice, known as Martin in Canada and the United States, and as Senor Ramon in Latin America. College chum and former party colleague of your present War Minister. That was twenty years ago, before I went to America. They certainly rid one of such ideas over there,—I mean the party idea."

"Aren't you disgressing from your subject?" observed Lindner.

"Indeed I am. Until 1917, I remained in America. Then the stupid tactics of your government offered our jingoists an opportunity to drag the country into the war. Then I set out for Mexico, and later for Argentina. I did all in my power to damage English interests, and as far as I am concerned, the war is not yet over."

"Personally, I am sure that it isn't over for anyone yet," injected Meixner.

"I arrived in Europe a few days ago and got to Berlin day before yesterday. Here I was given the information that my old friend had become War Minister. I looked him up and asked him if and how I might be of service to the country. He asked me to report to his office this morning, and instructed me to take charge of you."

"And the first thing you thought of was to arrest us?" inquired Lindner, with a touch of sarcasm in his tone.

"I had to attempt it because of the old man's orders. 'See whether you can't inveigle them to reveal their secret to you. If you are unsuccessful, we'll let them know that they can't count on us.' These were his orders."

"What a way of going about this matter! That is a democratic socialist republic for you all right!"

"Are you certain," asked the ever cautious Taussig, "that that is what the minister wanted you to see us about?"

Martin took from his portfolio an elaborate official envelope addressed to Lindner. It contained certificates of discharge for Taussig and Meixner from the army, a three years' leave of absence for Lindner, and furthermore, a personal note of the minister's which bore the following remark, "I have full faith in Mr. Martin and believe that he can do more for you than I can."

Lindner stood at attention. "From now on," he exclaimed "my allegiance is pledged to you instead of to the Prussian Government. An unasked-for leave of absence does not make me cease to be a Prussian officer, and I believe that my comrades' viewpoints are identical with mine."

Martin was almost overcome by this strong manifestation of military spirit. "A military relationship between us is out of the question," he declared. "We four will simply form a coalition to do all in our power toward the reconstruction of our bleeding country, and moreover, to do so on our own unofficial initiative. I have some pecuniary resources, and you have the necessary technical knowledge. Let us always act in concordance and with our one great aim in view. And now, please tell me what you said to the minister, and how you finally succeeded in checking the oxygen affinity of varium? By a chemical method?"

"No, but knowing that certain inert metals, such as gold, are resistant to oxygen, we finally tried to enclose varium in gold. For that purpose, we poured the molten metal through a narrow opening into a thin walled gold container and sealed the opening hermetically under high pressure, with the gold button. Such an arrangement proved to have a constant lifting power."

"But that must be a damned expensive method."

"We found several ways of making it cheaper. An extremely thin layer of gold is sufficient to keep the oxygen from the varium."

Martin nodded. "Splendid! How do you enclose the varium in such a thin sheet of gold?"

"One method is to gold plate the inside of the glass cylinder by electrolysis. Then molten varium is poured into the cylinder and the opening hermetically sealed, with the gold plug maintaining contact on the outside."

The guest rose. "Gentlemen, I am convinced that this thing can be carried out. Of course, you realize that we can't do it here in Germany. We will ship all your supplies of varium to Copenhagen within the next few days, where one of my steamers is in port. But that is not the most important thing at this moment. It is really urgent that you three disappear unnoticed, and as soon as possible, from Berlin, for if you remain here another three days, I can assume no responsibility for your liberty and your lives.

"Do any of you speak English?"

"All three of us do."

"Good! Do you have civilian clothes with you?"

"Yes."

"I want you to leave here right after me. Find out whether anyone is shadowing you. If anyone is, you will separate to make it as hard as possible for them. You will then go to the Hotel Victoria through the most crowded streets. When you get there, ask for room 21. Ask in English. That is the password for American detectives. You will be supplied with American uniforms and passports, you will also receive a wallet containing American currency and a detailed description and life history of the man in whose name each passport is issued. You will have to memorize these details."

"What about the photograph in the passport?" asked Meixner.

"That will be taken and pasted in at room 21."

"And the official seal, and the visa?"

"That too will be cared for. It is necessary that you catch tonight's train to Rotterdam. Take the express. Ask the conductor for car number 591, which is reserved for American secret service men. On mentioning 'Wilson Express', you will be given a private compartment You will then be traveling under the greatest protection in the world. The same password will make you immune from any customs inspection."

"Excellent!" said Taussig. "And when we get to Rotterdam?"

"An American gunboat leaves there the day after tomorrow for New York. Your passports and the password will insure the best reception for you, with most respectful treatment from the captain. Nor will anyone attempt to pry into your personal affairs and official mission."

"And when we get to New York, what then?"

"From there, you will proceed to Washington. Spend your time there studying American life,—and wait."

"For whom?"

"For me."

CHAPTER IV

Work Begins

● To the three friends it seemed a great risk to entrust themselves unconditionally to a man whom they had known only one day. They had handed over to him not only their lives and their personal safety, but also their priceless invention. But there are situations in human life in which a spontaneous and daring disregard of caution seems to be the wisest course to follow. Furthermore, they had unrestricted faith in the man who had sent to them their new confederate, with his own handwritten assurance that he could be fully trusted. Last, but not least, Martin's own personality, full of power and self-confidence, had impressed them greatly.

During the ten days' journey which they had carried out in accordance with Martin's instructions, not once did they have occasion to doubt Martin's sincerity. A feeling of security, reflected in their outward conduct, was undoubtedly responsible for the fact that they were not molested during the journey, and that their American hosts had not shown the least suspicion regarding their professedly official and secret mission.

When they reached their destination, they were surrounded by silent, friendly attention, which they as German officers accepted as something justly due them.

Their time of waiting, which they accepted as a vacation well earned after years of tension and dangerous activity on the front and in the laboratory, never found them with any doubts about the man whose guests they were. When he finally arrived, they did not attempt to ask him for any explanation of his activities in the meantime.

"Gentlemen," said Martin after a hearty greeting. "I'm afraid that they are at our heels. Immediate action is called for. We must disappear without delay."

"Where to?"

"I think that I have found a place that will just suit us. I've come to the conclusion that it is impossible to build a ship in the United States unless we do it under the auspices of the government. Conditions in Mexico are too unsettled, and Argentina is also out of the question. Pondering upon all this, an idea came to me. Many years ago I was involved in a law suit in Mexico. To have any chance at all in the Mexican courts, I had to be a property owner. So my attorney purchased for one of my employes, Ramon, by name, a tiny island in the lesser Antilles. I formally ceded my legal claim to this man, Ramon, and the suit was carried out in his name."

"Is this Ramon still living?"

"No. He died of malaria six years ago. His papers remained in my possession. In Spanish America, his name is as common as Müller in Germany, or Smith in America. All my possessions are recorded under the name of Ramon in the official files."

"How large is the island?" inquired Taussig.

"Rather small. About three square miles. Stony, infertile, hardly habitable, and almost inaccessible. Only its eastern shore is approachable, but the water there is so shallow, that only shallow draft boats can make a landing. The other sides of the island are so blocked by reefs and heavy surf, that no one has ever attempted to land there. I stayed there for one day and found stony ground, without vegetation except stunted grass and low shrubs. I noticed the rock formation of the island was chiefly quartz. And this fact, aside from other advantages, made me think of it as a site for our future center of activities."

"Is there any water there?" asked Taussig.

"Yes, on the north side where a narrow sort of cape connects the island with a hill about 650 feet high. Near the top, a spring leaps almost straight into the ocean in a kind of cascade. The water is fresh and has an excellent taste."

"We might utilize that for electric power," advised Lindner.

"But won't we have our varium with us?" asked Martin. "Don't you think that that would present a simple means of generating electricity?"

"But we are agreed," recalled Taussig, "that our varium should be used exclusively for building ships. Our 200 carloads won't get us very far at that."

● "But I think that we possess practically as much as 800 carloads," exclaimed Martin. "I have inquired of American mineralogists about the green sand. I was referred to a technical journal of mineralogy, and the first thing I found was a description of two places where the mineral is found. One is in Florida near Ohala, and another near Ubatuba in Brazil. I bought up the two lots while I was still in Europe."

"Fine!" commended Lindner. "What are your future plans?"

"Well, I think we shall proceed to our island and start on the ship."

"Just the four of us?"

"No. We must take help along."

"What kind of laborers are you thinking of using?"

"For preliminary preparations, I have already hired some peons, or native Mexicans. For the later phases of the work, we must secure workers from Germany. But what will we tell them if they ask for what sort of work they are being hired?"

"I think," Taussig suggested, "it would be best to tell them that the work would be quarrying quartz. We will have to have the situation well in hand and make sure that they are in sympathy with us and reliable before we show our real cards."

● "Under such circumstances we'll distribute our tasks," said Martin. "One of my freighters is en route to Florida and Brazil, carrying the varium sand. It is a 6,000-ton ship. The present cargo is 200 tons. One of you gentlemen will be in command of the boat. Another one of us will be in charge of a second steamer, which will be bound for our island with a cargo of materials and laborers. They will be used to finish preliminary preparations. A third one of us will go to Germany to hire skilled help. I myself shall remain in America.

"I shall have to raise cash by converting some of my larger investments in mines, property, etc. In three months from today, we shall have a meeting in New Orleans at the Hotel Washington. Only the one who is assigned to duty on the island will remain there. He will give whatever orders and requests he may have to the captain of the boat crew and thus they will be conveyed to us. Who wants to take over the Florida, Brazil territory then?"

"Dr. Meixner."

"And Germany?"

"Capt. Lindner."

"The island?"

"Dr. Taussig."

"After the allotted three months, I hope that we will all have completed our assignments and be ready to proceed with the construction of one or perhaps several ships."

Next to Lindner's task, Taussig's was undoubtedly the most difficult for he had trouble in making himself understood by the natives.

His first task was to make the island inhabitable for civilized people.

The first houses were crudely erected with boards. Later they were replaced by cabins of corrugated iron. These housed the laborers who excavated the ground for the foundations of more permanent structures Another group of laborers were assigned to the regulation of the fresh water spring. They dug a new creek bed in the stony ground leading to the site of their new settlement, so as to have water on hand all the time.

A third group was erecting a small plant to contain a turbine just below the waterfall. Part of the creek was to be diverted and used to feed the turbine. The whole arrangement was meant to be a power house supplying the whole island with current. Taussig discovered through the breakers a narrow, but adequately deep, channel leading into a wide bay north of the natural bridge which connected the two parts of the island. He ordered two illuminated buoys to mark the channel. When the four friends met again on the island, the power house was completed.

To Martin's agreeable astonishment, his two freighters found easy access to anchorage in the artificial harbor, guided by two rows of lighted buoys. On the very next day the Mexican laborers returned on one of Martin's freighters to New Orleans. The Germans, whom Lindner had hired from north Germany, took their places. There were 200 of them amongst whom were sixty former regular army officers and petty officers.

The work was continued without delay. A group of concrete structures was erected.

Thus was built house after house, first without roofs, doors, or windows, but already equipped with a plumbing system, and electric and telephone wiring. The power house had already been completed, also a central telephone switchboard, a station for wireless telegraphy, as well as the addition of a high-tension transforming station. Many storage batteries connected in series were concealed underground. Below this battery level, spacious cavities had been dug for storing the varium oxide. A good sized area was leveled for the wooden hangars. These were to house the airships.

Presently the two steamers returned, just in time to replenish depleted stores of materials that were nearly exhausted. The two boats were quickly unloaded, and once more Martin returned to the American continent.

The battery was equipped with guns. Two six-inch howitzers and two eight-inch mortars had to be used instead of long barreled ship's cannon which were preferable, but Martin had no other choice, because his freighters were not able to carry heavy cannon in addition to other cargo.

The boat that had come from Germany had brought, besides heaps of newspapers, some heavy rolls for newspaper printing and a printing press.

"Now," said Martin one day, "we'll found the ideal state of tomorrow. The only thing left to do is to populate our island with women and children."

● "As for that," remarked Taussig dryly, "it is my intention to make an announcement in the first issue of our paper that we will arrange for passage for the wives and sweethearts of all of our employees who might wish it, upon application. I am sure that every one of them has someone in the old country to take advantage of our offer."

"I haven't," denied Martin.

"Well then, she is probably in America. Women would be very useful here. Although the food problem is taken care of at our central kitchen, there would still be a thousand things that our settlement would need to give it a more civilized appearance."

"Yes, I fully agree with you," Lindner approved.

"So do I," joined in Meixner, "but then I would have to have a larger hospital and an adequate staff."

"Are there still more suggestions?" inquired Martin. All remained silent.

"Then let me have a few words on the ultimate purpose of our being here. It is for the construction of our ship which is to be both an airship and a submarine. Here are the drafts which you handed to me three months ago. One thing I want you to explain to me. The ship floats in the air, carefully balanced, doesn't it? Now, if someone moves out of the center line, he will upset the equilibrium and make the ship tip over. Am I right?"

"Not quite. If the ship's body is sufficiently stabilized, there can be no danger of that. Have you noticed the four bulging corners of the ship's shell?"

"Yes, and I wondered what their purpose might be."

"Quite simple. They are stabilizers on the gyroscope principle. They will not permit the ship to be brought into any other position than a horizontal one."

"Excellent! And how many ships shall we build?"

"As many as we can," informed Lindner.

"Three," Taussig suggested.

"And why three?"

"Here is why: We have about 900 carloads of varium. Thirty-five or forty are enough to build a ship 80 feet long. If our army had had only one of that type, the war would have ended with Germany the victor."

"And for this far-reaching purpose, you think three varium ships sufficient?"

"One of them would be, but because we shall encounter many obstacles in building and operating the first one, we'd better build two of the same type to begin with. One of them may be destroyed. But two such ships would be more than enough to defend successfully a greater territory than our hideaway against all the fleets of the world."

"What about the third vessel?"

"For that I intend to use the remaining 800 carloads of varium. That would be 8,000 tons, which means a lifting power of 56,000 tons. It will be a giant among its brothers. Big enough to carry our entire settlement. I am thinking of taking it to another island, say in the South Seas, and fit it to be the home of a thousand or fifteen hundred people. Once we have sunk one or two English or Japanese men-of-war that might object to our occupation of the new island; once we have shown the world that we have sharp claws and know how to use them; then, and only then will they let live in peace. They will recognize us as an equal power, make commercial and political treaties with us and invite us to their League of Nations. And then Germany's time will have come to maintain her old-time prestige against all the nations of the world."

CHAPTER V
Unexpected Guests!

● In the following weeks, shipment upon shipment arrived. Tasks became more and more numerous and difficult. In the quartz quarry the moulds for the varium anti-gravity elements were being made. The foremen wondered about the purpose of the thick-walled, cube shaped quartz containers.

Other buildings that had been completed included a finishing shop for the final touches to be given to the crude quartz objects and a movable electric welding outfit for welding together the individual varium elements.

Besides the regular food supply from Rotterdam, every ship brought over a number of women, and the minister, an indefatigable match-maker, was busily engaged in joining young couples in the bonds of matrimony.

One night a delegation of workers appeared before Martin. They said that they felt ashamed of living so luxuriously while their countrymen were in such dire distress and that it was not right for them to have left their country at a time when they were needed most. Not that they were unwilling to stay they assured him, but that they felt in duty bound to return again to Germany.

The four patriots felt that the time had come to reveal to the workers their real intentions.

Martin asked the spokesman to call his followers together the next morning after church. This was Saturday, and he had planned to give them his answer on Sunday after they had attended services.

The meeting turned out to be a veritable festival at which the seal was placed upon a pledge of unswerving unity between the leaders and their followers, a kind of collaboration which is rare among Germans. All rejoiced when they learned of their mission. At last a faint glow of hope appeared in the dark night of Germany's disgrace and misery. An opportunity, though remote, to contribute by their efforts toward a speedy recovery of the Fatherland. They acclaimed enthusiastically Martin's ideas and the adulation he received proved that they would willingly endure hardships and years of exile from home to do their share toward the realization of their glorious aim.

The four returned to the administration building. As usual, Lindner and Taussig engaged in a lively discussion.

"Pardon my intrusion," they were interrupted by Martin, "does anyone know where Meixner is keeping himself?"

"In the hospital, very likely. He has two patients there. He was not at the meeting. Why don't you call up the hospital?"

"He's not at the hospital," reported Martin after a short telephone conversation.

Taussig casually looked out of the window. The next moment he wheeled sharply on his heels.

"The boat is gone,—and I saw her at anchor only a few hours ago!"

Martin reacted to the alarming statement by a dash to the door.

"Where are you going?" someone asked.

"To the pier, of course."

"That won't do any good. Inquire at the telegraph office."

So Martin inquired and learned that an S. O. S. had come from a vessel at sea and had been picked up at the office two hours before while the meeting was in progress. Reluctant to cause any great excitement or to break up the meeting, he had, so the report stated, given immediate orders to get the boat's steam up, and had then set out to participate in the rescue of those who had signalled for help.

Martin looked relieved. "Thank God!" he said, "I suspected a plot."

Taussig shook his head in some perturbation. "I only hope that he can get the other boat afloat again. Otherwise, he's as likely as not to bring the whole shipwrecked crowd over here to give them medical attention."

"Don't be so pessimistic," said Martin reprovingly. "You are right, of course, so I'll try to get in touch with him by wireless, and ask him to take those people to Kingston."

● Martin's decision to use for the first time the transmitter of their island station proved to be rather unwise.

His message calling Dr. Meixner caused great excitement along the Atlantic coast, and the colonists intercepted countless inquiries about their station which was nowhere on record.

"There you are!" exclaimed Lindner in a worried tone. "We can't keep this up, or else we will have a squadron of English battleships pouncing upon us, and that would mean goodbye to our plans. We'll just have to let Meixner shift for himself."

A period of several hours of waiting then kept the friends in anxious suspense. At last, at three in the morning, the lights of the steamer were sighted. At 4:30 A. M.

the boat made fast to the dock. Coming down the gang plank, there were seven strangers mixed with the crew. Five of them were walking, while the other two were carried on stretchers.

"I can't understand you," Martin turned to Meixner angrily, "what did you bring these people here for?"

"I should think that an ordinary sense of humanity would prompt anyone to land them within reach of human care and medical assistance as quickly as possible."

"To Hell with your humane feelings!" exclaimed Lindner. "You could have taken them to Kingston. They could easily have stood another day at sea under your expert medical vigilance."

"And may I ask, gentlemen," inquired Meixner, astonished, "why you are all flying at me about this matter. I can't see how these poor devils can be in the way here on the island."

"Not here, of course," explained Taussig, "but you can't keep them here till judgment day. Until now, every old sea dog thought that this island was uninhabited, that it had no harbor, no approach, that there was nothing to be gotten here; in other words, the thing that will now happen is that sailors will bob up from all over the world with their tales of a densely populated island, a factory, a crew of workers, a regular harbor, and what not. Or were you cautious enough to keep your guests below deck while getting ready to put in to dock?"

"I never thought of that."

"Well, it makes little difference one way or the other. They'll tell of their rescue, make known the approximate location of the island, and then we'll have the whole crowd barking at our heels."

"What crowd?"

"First of all, some of the coastal merchants trying to sell us their wares. And the harder you try to shake them, the more persistent they'll become. Then if you do succeed in chasing them away, they will bring the whole affair into the papers, attracting attention, and then perhaps invite American or English, or at best, Mexican intervention. Those governments will naturally send officials to investigate the activities in this territory. To think that we have exiled ourselves here and worked hard for a half year, only to have everything shattered by an untimely discovery of our plans."

"What kind of people are they?" asked Martin. "What is their boat like?"

"The boat is gone," Meixner informed him. "It was a schooner with a crew of seven. We were able to rescue all of them. Two of them were struck by crashing masts and found unconscious. It was a 1,500-ton vessel at most."

"What is their nationality?"

"Portuguese."

"British subjects?"

"No, I think they are smugglers. That is the only way I can explain the fact that their boat was equipped with a complete wireless outfit. Smugglers, you know, aren't exactly rare in this part of the Atlantic. I don't think that these people would do much squealing; we have them in as tight a place as they have us."

"That makes it all the more delightful," said Taussig acidly. "To be at the mercy of professional law breakers. Just as soon as they become aware of the secrecy of our operations, they will regard us as brothers under the skin. Then they will not hesitate for a moment in making this island a central trading post for contraband."

"No," said Martin determinedly, "I shall not consent to any such thing. But what can we do?"

"There is only one way out," suggested Taussig. "Beat them to it. Make a report to Mexico of our operating a quartz quarry and a factory manufacturing quartz objects. We'll get another melting oven, manufacture an ample number of quartz objects and ship them to Mexico at regular intervals."

● Three days after, one of the Portuguese died without regaining consciousness, the others recovered. Meixner had kept them in two rooms with windows facing toward the ocean, they were given some money, taken aboard ship, and put ashore at Cuba.

The captain also attended to some matters of business there. He mailed an official notification signed by Don Louis Ramon. It was to the effect that he had opened a plant for the manufacture of quartz goods on the island. Enclosed were a number of blueprints, a computation in the form of a kind of trial balance showing the probable return from the capital invested, and a $100 bill to cover fees.

At last, work on the varium vessel could be begun. What a painstaking task it was! The wooden skeleton looked like a bee hive. Each gravity nullifying element had been inserted into an individual wooden case, and each had to be welded on four sides to the adjacent elements. This required utmost accuracy and care, and no less than every third one had to be done all over again upon inspection.

After the bottom of the ship's hull was completed, the construction hangar for the second vessel was erected. Now that all the workers had become familiar with their duties, everything went on with considerable speed.

Soon the partition and sides of the ship were under construction, while the bottom of the second ship was nearing completion. A site had also been selected on the main part of the island and levelled. On this was to be eventually erected the hangar to house the giant brother of the two smaller ships.

The next steamer brought a number of skilled mechanics from Germany. They were assigned to the construction of the huge propellers from the hardest, rustless material.

Each of the three friends did the work of several men. Martin and Lindner hurried from one construction site to another. Meixner divided his attention between the hospital and the shops; he had become a terror to all the workmen. Every welding connection between two varium elements was subjected to a rigid test, especially devised by him. He would reject all soldered connections showing the slightest irregularity, and demand that they be done over again.

Taussig was now in his laboratory, carrying out all sorts of experiments pertaining to the work, now in the forge where the first varium motor was nearing completion, scheduled to produce 6,000 horsepower. At other times he was busy at ship number one, supervising the installation of electric equipment.

Every night at six o'clock sharp, work was stopped for the day. At seven o'clock, after dinner, a spirit of pleasure-hunting and gayety prevailed. Theater, concerts, a moving picture, now and then a scientific lecture or some sort of humorous presentation: these were the pastimes of the evening. At nine the daily paper came out. Each morning at seven the work began anew. It was interrupted only by an hour allowed for lunch.

CHAPTER VI

Death from the Tube!

● The partition walls and the shell of the first ship had already risen to the height of a man, when one day Martin received the report that a shallow draft boat, like that of an inspector, was approaching the old pier of the island. This pier had fallen into disuse a long time previously. Martin hurried to the pier. Two men in pompous uniforms were landed. They identified themselves as officials of the Mexican Government.

Near the old pier there happened to be an old structure still remaining from the first days of the settlement. It had been cleared of its primitive furniture a few days before. Martin led his guests there, suggesting that they have a bite to eat before the strenuous duties of inspection. There were, unfortunately, no women on the island, Martin told them, but they would not spare anything that could be found in the pantry or in the cellar.

Request after request was sent to the nearest building. Through instructions delivered by telephone, upholstered furniture, spotless table linens, delicacies of every kind, the best of wines and liqueurs appeared as if by magic in the humble interior of the wooden shack. Even the motion picture operator was requested to bring a projector, and an improvised theater was set up in quick time. A few pictures of voluptuous natives were reeled off, so voluptuous that no censor anywhere would have passed them as fit for public performance.

While the two Mexican officials were thus enjoying themselves, the few hours seemed like so many months to our four friends. Work had stopped abruptly in all the shops. Excited little groups gathered everywhere, discussing this latest development. There was no way of concealing the partly built airship. Only a blind man's eyes could have missed it. Some of the workers set tables outside their homes and set quaint objects upon them, attempting to present the appearance of a busy factory town.

However, the worst never happened.

After four hours, the three friends saw, through their field glasses, how Martin, alias Senor Ramon, escorted his official visitors back to the government boat, where foreman Schmidt had given the crew as royal a welcome as their masters had had on shore. After a short while, Martin rejoined his friends, and related humorously his experiences with the Mexican officials.

When, in the progress of their banquet, they had arrived at the usual demi-tasse and Havana cigars, one of the "Excellencies," (Martin had tactfully addressed them thus), put a few questions to him, asking what was the nature of their purpose in staying on the island. "Senor Ramon" was also asked of what nationality his workers were, to which question Martin had answered to their complete satisfaction that, except for the executives, all of the employees were imported from Europe. Martin's flattery had kept the conference running smoothly and in a most amiable spirit.

Then later, one of the two men had remarked that a law had been adopted requiring a head tax of $1.00 on each imported foreign laborer, engaged by a property owner. The tax was payable monthly. Martin hastened to ask to which office he could remit the sum owed by him to the government. They had replied that it might not be safe to remit the fees by mail. Then "Senor Ramon" asked whether they would object to personally accepting the money.

His inquiry was promptly met with acceptance of the money, for which Martin was given a receipt for $3,000.

The officials exchanged pleased smiles between themselves and then proceeded to discuss the prospectus which the company had submitted to the government some time before. They thought the estimated return far too low, and, upon Martin's request to fix the assessment themselves, calculated a tax obligation of $12,000 per annum, on a basis of the number of workers.

This sum, too, was given to them and more smiling glances were exchanged between the two officials. Then they proceeded to warn Senor Ramon against the smugglers, pointing out that before the war, the island had been a trading headquarters for contraband of almost every description. The smugglers, whose business was beginning to flourish again, might some day remember their old hangout and make themselves at home on the island in a very unpleasant way.

Senor Ramon thanked them very heartily for their well-meant advice, adding in an undertone of fright and worry that now he himself felt defenseless, since he could not expect the Mexican Government to furnish him special protection, by having one of its patrol boats constantly on duty off the island.

"What were you driving at with your remark?" asked Lindner, astonished.

● Martin laughed. "The best part of the story is yet to come. The two gentlemen undoubtedly took me for a smuggler chief who would willingly enter into an agreement with them, and with whom they would be glad to do a little business, all the more because their wages are in no way proportionate with the seeming authority of their pompous uniforms and high-sounding titles. Their titles are the equivalent of the positions of department heads in our state administration, yet one of them makes his living as a bazaar keeper in Mexico City, and the other is a representative of an American automobile factory.

"Hard to believe," said Lindner.

"That's not all yet," Martin continued. "Since the republic could not offer me adequate protection, I asked that I be permitted to protect myself, which request the two men found reasonable enough. Whereupon they appointed me Mexican Governor of this island by Presidential decree. They had his signed blanks with them."

"You,—governor!" exclaimed Taussig.

No," 'Senor Ramon,'" replied Martin slyly. "And Lieutenant Governor is our foreman, Julio Schmidt, who was made a Mexican citizen by a certificate pre-dated ten years."

"How much did they get out of you for those decrees?"

"Five thousand dollars."

"Pretty steep."

"Then we drank a pledge to friendship, and after awhile reeled off our risque films. They were so enthusiastic over them that I persuaded them to accept them as a gift, together with a projector. Our leave taking was very cordial and they promised to return next year to collect the taxes."

Lindner shook his head thoughtfully. "That's what they told you. But God knows what they will report to their departments."

"Well, they certified every point of our prospectus, and now I am governor on this island. My guns will be government property. I can assess taxes and tariffs and

exercise jurisdiction within my territory on behalf of the government. As official of a recognized country, I can face foreign visitors with much more authority than otherwise, and I hope that for that reason we'll now be enabled to complete our job undisturbed."

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A week after Martin's (Senor Ramon's) appointment as governor, Meixner made a strange discovery.

He was experimenting in his laboratory with a set of Geissler tubes, sealed tubes containing diverse gases of different pressure. If a current from an induction coil is permitted to pass between the cathode and the anode of such tubes, it will cause the gas contained in them to become luminous in a way characteristic of its chemical nature. Meixner's experiment was to study the reaction of varium when subjected to such conditions.

After extensive preparatory experiments in which Lindner had rendered valuable assistance, Martin had succeeded in coating the inside of a Geissler tube with an infinitesimal, translucent layer of metallic varium, thus adapting the Geissler principle to experiments with varium. The reader will remember that the extreme oxygen affinity of varium required a shielding of some inert metal.

The four men had gathered in Meixner's X-ray laboratory. Lindner and Taussig, who had not expected any startling results from the experiment, stood in a corner of the room chatting. Taussig was leaning against a laboratory bench, his hand casually resting on the gold contact button of a varium anti-gravity element. Then Meixner turned on the current, his gaze fixed intently upon the varium filled tube from which he expected startling revelations to issue.

Something very strange did occur, although of a very different nature from what Meixner expected.

(Illustration by Paul)

Something strange happened. Martin and Lindner fell to the floor as if stricken, while Meixner fell back into a chair as if motionless.

The discharge between the two electrodes was quite inaudible, unlike that of an ordinary Geissler tube, and only a faint reddish glow indicated that anything was going on within the tube.

But the very moment that Meixner's hand had started the current, Martin and Lindner fell to the floor as if stricken, while Meixner fell back into a chair and lay motionless. Only Taussig remained unaffected by this mysterious influence. Startled, he noticed what had happened, trying at the same time to discover an explanation for the phenomenon.

His first impulse was to rush to the assistance of his friends. But a calm, cool-headed reasoning deterred him from this immediate action. It came to his mind in a flash that the fact of his being connected with a varium element might have been his assurance of safety.

● Cautiously he picked up the varium element, making sure to remain in contact with its metallic end, and then he crossed the room. He turned off the switch. The glow in the tube disappeared.

Now he attended to Martin and Lindner who were lying on the floor, contorted as if in convulsions. At his attempt to assist them to get up, the two awoke and rose by themselves, astonishment written on their faces. Meixner, too, had gained consciousness in the meanwhile. After a few explanatory words from Taussig, they all agreed that perhaps they had made a discovery of far-reaching importance.

Construction work on the ships was temporarily abandoned. The entire population of the island was subjected to the new ray, and the necessary amounts of varium for protection were determined.

As a means to be employed in warfare—the thought of war lay behind all their endeavors—only a far-reaching effectiveness of the projection of the ray would be of any real service.

If they could send paralysis and sleep miles ahead, the enemy guns would cease being a menace to their advancing troops. Without a battle, the enemy could be rendered unconscious and disarmed in their helplessness. No defensive mechanism could be of any avail against such a weapon.

But the experiments were disappointing. No matter how large the tubes, the rays would lose their power at a distance of fifty yards, although within that range they penetrated any commonly known substances, such as water, air, metals, etc., stopping only at varium, one gram of which was sufficient for human protection.

A person affected by the ray could not be aroused so long as the influence continued. Upon interruption of the radiation, the coma would change to deep sleep, from which the affected person could easily be roused.

Vertebrates, insects and crustacea reacted very exactly to the rays in the same manner in which humans were affected, whereas mollusks, worms, and other low forms of animal life seemed much less affected by the rays. If the range of the sleep-spreading rays could have been increased to one of more miles, Martin would have abandoned the construction of the airships and turned his entire energy to the exploitation of this new discovery as a super-weapon for war purposes. Before he was forced to admit the impossibility of his high-flying ideas, he would speak of nothing but returning to Germany, getting into touch with all of his officer friends who, he thought, might be interested in such an aggressive idea.

He spoke of a coup d'état to be effected against communists and pacifists. But the cold reality of physical facts dealt him a hard blow and he was forced to abandon his ambitious plans. The whole discovery could be utilized only as a defensive mechanism on a small scale. They decided, therefore, to equip each chamber with a sleep-dealing varium X-ray cell, while all the members of the colonies were given rings in which were enclosed a small amount of varium.

And so the four friends decided to forget about their shattered hopes and devote themselves to the construction of the airship with renewed energy.

CHAPTER VII
Above the Earth!

● The work went forward with giant strides. The partition walls and the shell were completed at the same time. The foremost chamber was equipped with two guns and a machine gun, as well as with necessary compartments for ammunition. This chamber had one window on each side. The second chamber, most spacious on board, was the control room. It had two large side windows, each as tall as a man and made of specially heavy ediromatic plate glass.

The control room was furnished with two tables and five chairs. A number of drawers and closets completed the equipment. All these things were screwed to the floor and contained anti-gravity elements wherever space allowed. A winding stairway led from the control room to the dome-shaped roof exit which had been constructed perfectly airtight at a great expenditure of money, care and patience.

The chamber behind the control room was fitted as sleeping quarters, with part of it set aside for storage. Behind this was a smaller room which led, finally, to the engine room. The latter consisted of an axle with a number of huge discs mounted on it. This was the varium motor. The engine room was accessible from three sides. The motor axle had attached to its end a heavy two-blade propeller of nickel steel. The same meticulous accuracy which distinguished every detail of the construction was observed also in the appointments of the four rooms devoted to the housing of the gyroscope stabilizer. The connecting doors, which sealed one room from another hermetically, were masterpieces of craftsmanship.

At last, Taussig formally announced the completion of the craft and set the date of its trial trip for the next day.

* * * * * *

Our four friends were too excited to get a full night's sleep. They tossed all night with all sorts of doubts and fears. Would the ship really rise, and would all their instruments function properly? Would the ship be able to withstand bad weather conditions?

Each wanted to be the first to take the first trip alone so as to save the idea and the lives of the others if he gambled and lost his own.

They were up and dressed long before sunrise; the first beams of the ascending sun greeted them on the flying field two hours before the time set for the take-off. Boards and logs were lying about everywhere but their expectancy got the better of their sense of order and neatness.

"Our workers will clean up the place after we have left."

The four finally boarded the ship. Taussig insisted

upon operating the controls, although he had explained the operation of the control board a number of times to his friends.

"Gentlemen," spoke Taussig, now leaning back easily in his chair, "please take your seats. Hold on to the arm rests with your hands and to the chair legs with your feet. For, when I turn this wheel, our ship will rise into the air instantly and with tremendous speed."

He turned the contact wheel to the extreme right position.

"What the .....!" he exclaimed. "We seem to be glued to the ground, yet our lifting elements worked perfectly on the testing stand."

"I always did expect some such difficulty as this."

"Don't get excited yet," laughed Martin. "How do you expect your lifting elements to function if you neglect to put a charge into them?"

He was right. In the excitement, they had omitted starting the static generator.

"Put your wheel in neutral," instructed Martin. "I'll crank the motor. But please don't raise the ship before I have regained my seat."

"In the devil's name, what is the matter now?" Taussig shouted angrily. "The motor is going, I can hear the static machine whirring, yet the ship is as motionless as before."

The four men looked at each other dismayed.

"I can't explain it," whined Taussig in a disconsolate tone, rising from his seat. "All the lifting elements are in perfect condition. So are the welded surfaces. For the perfection of the electrical connections, I could, with my ————."

Before he could finish his sentence, a powerful shock threw him back in his chair. The daylight flooded brightly into the room through the floor window, and the island was shrinking away from them more and more rapidly.

Taussig collected himself immediately. Then he noted the reading of the altimeter and rapt attention wreathed his face. Turning the wheel in both directions, he finally arrested the ship's lightning speed.

"This is the position of the wheel when we are just floating." Saying this, he marked the position on the wheel frame.

● The others were still paralyzed with speechless ecstasy.

Their ship was a success, then. A new invention had stood the test, man at last had broken the chains of gravity! No one could tell what their discovery might eventu ally lead to after tireless development.

"The only thing that I can't understand," puzzled Lindner, "is why the ship didn't rise immediately."

Martin rose from his seat. "The reason is quite plain. It takes some time to charge the condensers. But let's see now just how much good our stabilizers are, whether we can really walk around without disturbing the degree of the ship's angle."

He walked over to the second static generator, which he started. "Really, Taussig," he said, "you should install an automatic starter here, and connect it with motor number 1. It is bad enough to crank one engine before every start."

Lindner and Martin had grown silent. They were filled with pride and joy. Not having learned to overcome their excitement, they sat almost petrified, staring unseeingly, eyes wide open and lips tight. They felt a child-like urge to dance with joy. Meixner and Taussig, too, had tears of triumph in their eyes. They tried to conceal their feelings behind a matter-of-fact conversation.

"Well," suggested Taussig, "let's stop playing balloon, going wherever the wind takes us. Let's give the propeller a try-out."

Incredibly fast the craft gathered speed, and their island sank below the horizon.

What was this ahead of them? Mountains or clouds? In a few minutes they were over it. It was Puerto Rico. Only half an hour in the air and covering a distance that for a torpedo boat would have required six hours—marvelous! And Taussig had been operating the ship at only half speed.

Presently Taussig gave an order to Meixner. The latter disappeared for awhile, and on returning, nodded an O. K. to Taussig who stopped the engine and turned the control wheel to the extreme right.

The view of the earth's surface grew broader and less distinct. A deep howling tone struck their ears, like the sound of a furious storm. The tone became higher and louder until it reached the shrillness of a whistle. Then its intensity lessened and finally the noise died into silence.

What an extraordinary picture greeted their eyes! The earth seemed to have disappeared. All that could be seen below was a whitish, cloudy disc, motionless. Above, and from both sides the nocturnal sky with its stars shone with a splendor indescribable. In the east the sun was sending down its flaming missiles with a force untempered by a moist atmosphere.

Presently the veil of clouds cleared away. Below them, like a golden mirror, lay the ocean. With one glance they could sweep in all of the West Indies, and on the other side lay the Gulf of Mexico, the southern tip of Florida, the Isthmus of Panama, and all of Central America, which had become visible too.

"My Lord, this is beautiful!" Martin gasped in wonderment.

The glorious view disappeared again and once more ocean and land were covered by the milky layer which obstructed the downward view.

The altitude control was pointing to neutral; the propeller was silent, and only the stabilizers made a low humming sound.

The clouds which had thus far made it impossible to see the surface, were slowly dispelled. The lustre of the ocean had become less and the sun, too, had lost some of its brilliance, and now the black of the skies had acquired a very dark blue shade. Once more the earth disappeared from view. The sun and the sky became invisible.

"We are in a cloud now, aren't we?" Meixner inquired of Taussig.

The latter nodded.

"But we have already been twice in the clouds," argued Lindner.

"Not at all," interposed the ship's commander.

"What are we going to do now?" Lindner wanted to know.

Taussig gave the wheel a short turn to the left and then returned it to its old position after a moment. The ocean, sun, and sky came in sight again.

"See where we are!" Amazement showed on Martin's face. "Here's the coast of Mexico. Only a short time ago we were over Puerto Rico. A gale must have carried us so far."

"Yes. Didn't you hear it howl a while ago?" Lindner reminded him.

Taussig shook his head and started the propeller engine. "No, you guessed wrong. The fact is that we rose so high that we fell behind the earth's rotation."

"Your explanation is beyond me."

"Now gentlemen, I warn you to hold on to your chairs."

"How high up are we now?" Martin asked.

Meixner consulted the instrument below the central window. "About 10,000 feet above sea level."

● The ship made an eastward swerve, its nose tilted, and the ocean drew nearer and nearer.

"Now, what?" queried Martin.

"We'll go under water," Taussig informed him, at the same time turning the control wheel. "Of course, I will have to slow up our speed. You see, we are still lighter than air, but the downward position of the ship, together with the propeller action is forcing the craft down."

"Are all the exits closed tightly?" Lindner asked anxiously.

"There is nothing to fear," reassured Martin. "We were up more than 10,000 feet, an altitude of very low pressure, yet our inside pressure remained constant, as the barometer indicated."

Nearer and nearer came the water's surface. With an abrupt suddenness, almost complete darkness swept the interior of the ship. The electric lights in the control room flashed on; Taussig brought the ship into a level position. His eyes were glued to the manometer while he turned the control wheel.

"You are neglecting the periscope," Martin remarked.

"We'll come to that later. First, I have to find the position of the wheel at which we have exactly the gravity of the water. Seems rather difficult.....Now I've got it."

He marked the spot on the wheel. "Let's go a few miles eastward. According to my charts, the ocean is fairly deep in this region. Here is the switch for the front floodlight. Now for the periscope. Great! It works fine."

"How deep are we now?" Meixner inquired.

"Eighty feet below the surface. We'll turn on the outside floodlights now and stop the ship."

"What for?"

"You can admire the fauna of the ocean while I try out our periscope."

"What can you see?"

"See for yourself. The camera has two oculars. In the east there is just vast ocean. Let's turn it north now. —Nothing there either. But in the west, what is that?"

"Possibly a flock of sea gulls," ventured Meixner. "Or perhaps a group of sails. We must accustom ourselves to observing through the periscope. Here, south of us, Martin, what is that?"

"That is a man-of-war. It is so small, however, that I cannot distinguish its details."

Taussig attached a tube to his ocular. "The picture is so bright that I can easily magnify it ten times."

Meanwhile, Martin's interest had been held by what he could observe through the numerous portholes. Soon he exclaimed:

"Come over here and look. Just look and marvel at such a sight. This is the finest aquarium I have ever seen. The next time we come down here, we must take our diving suits with us. I've simply got to go out there. Why aren't you coming?"

"Just a moment," Meixner shouted back to Taussig. "Say, do you have another one of these magnifying attachments?"

"Yes. In the second drawer. There in the instrument cabinet, way back at the left side."

"Can you see it clearly now?"

"Yes, but what is the meaning of all this?" excitedly asked Meixner. "There's a boat now, manned with English marines. I can recognize their uniforms now. She is coming closer."

"Apparently they have discovered our periscope and are coming to try to take the thing on board with them. But the gentlemen are aiming too high. We couldn't let them have anything so precious as our eye."

Martin let out a cry. "What did you do, Taussig? Now, all of a sudden, I see the ship from the side while the boat is farther away. But it is coming nearer again."

"What is the matter with you?" Martin demanded. "Why do you pass up this marvelous spectacle? I've already called twice."

"Afraid I'll have to break up the show," Taussig announced, turning off the outside floodlights. "Lindner, will you please go forward and keep a watch on where we are going? We have to get away from here. You, Martin, stay at the periscopes and keep us posted."

"Why did you darken the lights?" Martin wanted to know. "It certainly was a glorious view. I could have stood there for hours."

"I did not build my periscope for England," answered Taussig, inviting Martin to take a look for himself.

"What is this I am seeing?" he exclaimed. "An English boat and they are headed directly this way, aiming directly at me."

Meixner manipulated the controls. "That means the periscope, not you. Let's get out of their way."

There was a swishing of water. "What are you doing, Taussig?" Martin turned to ask.

"We'll run away from the battleship."

"But why should we?" protested Martin heatedly. "Aren't we more than a match for them?"

● "But now can they pursue us?" wondered Martin. "I see that they are following us even though they can't see us."

"They can't see us, but the periscope."

"Can't you pull it in?"

"Only if I submerged 200 feet below the surface. Tell me, though, who is making better time?"

"We are," replied Meixner, "our pursuers have almost disappeared."

"Stop!" shouted Lindner from the front chamber.

Taussig jerked a switch and the passengers experienced a sudden jolt.

"We almost crashed into a rock," Lindner said in a frightened voice. He looked quite pale and staggered.

"Yes," affirmed Taussig, "the depth of the water is growing less. There is nothing left to do but rise and flee by air. Naturally, the British will see us then."

"What if they do?" retorted Martin defiantly.

Taussig shrugged his shoulders and swung the control wheel to the right. Suddenly the passengers were almost blinded by the brilliance of the sunlight which rushed into the cabin. It was almost physically painful. Only gradually could they accustom their eyes to its glaring brightness.

"Where is the warship?" now asked Lindner.

The three companions pointed downward toward the ocean's surface. "They are making good speed, but don't go so fast, or else we'll lose them from sight."

"And they us."

"Where to now?" Lindner asked.

"Home to our island."

"How do you intend going about landing?" from the curious Martin. "Wouldn't it be safest to land on the water in the harbor?"

"What for?" argued Taussig. "Why not on the construction site?"

"But how? You are liable to crash the ship."

"Ridiculous." The commander passed the thought off lightly. "At a certain position we have no weight, yet a volume of about 900 tons. You have observed countless times, haven't you, how easily and how free from danger very light articles, such as down from feathers, for instance, descend?"

"But they are mere playthings in any sort of a breeze."

"The atmosphere is perfectly calm. Just look at the water's surface. But you have me started on a new idea. An improvement."

"An improvement," repeated Lindner, naively. "Could anything be more perfect than our ship just as it is?"

"Just a slight technical detail, that's all."

"Be more explicit."

"An anemometer, a wind gauge. It will be of appreciable assistance in landing."

"Anything else?"

"Nothing at the present moment. But now, let's watch out. Here is our little island." Then after awhile, "Just about 300 feet above the ground. We will have to undertake our landing with great care."

Taussig manipulated the levers in slight jerks, just mere fractions of an inch at a time. Slowly, very slowly, the craft descended yard after yard.

"Here we are," announced Taussig shortly, proudly adding, "Did you feel even so much as a tremor when we touched ground?"

He rose. The four men looked at each other, each filled with indescribable emotion. On a sudden impulse, they embraced each other. There were traces of tears in their eyes. Here they were far from home, four men, hardened by life, yet they were not ashamed of their feelings. They felt that the last hours of glorious success had welded them together closer than many weeks of relentless toil.

They were about to leave the ship. On the platform Martin paused a moment. "Friends," he addressed them solemnly, "I have a name for our craft. We shall christen her *Astraea*, yes, Astraea, the splendid star."

CHAPTER VIII

A Startling Plan

● The first trial trip had suggested a few minor improvements. They installed the wing gauge, as suggested by Meixner, also a secret switch under the control board, so that no outsider could start the ship.

Throughout the summer, the four aviators took trips in their wonderful craft. Inclement weather was not allowed to deter them nor discourage their flights. However, the weather, for the most part, was favorable. Only once were they caught in a storm. The gale took hold of the ship, whirling it dizzily about in circles while the engine proved too weak to master the force of the gale. They finally managed to rise to a height of 15,000 feet where the tornado had lost its force. Here, they found a real reward for the anxiety they had endured while battling the storm. In complete leisure and safety, they could observe one of the most magnificent and ominous of nature's spectacles, that of the raging elements.

When firing the guns they encountered a new difficulty for the craft, as a whole, was normally weightless, while any projectiles, not attached to lifting elements, would retain their normal mass. On being fired, the latter would receive an infinitesimal share of the total energy produced by the explosion, and the weightless ship almost all of it. The result would be a violent thrusting of the ship in the opposite direction from that in which the gun was fired. In cases where the gun might be aimed in any other direction than that of the body line of the ship, there would also be a strong recoil tending to whirl the ship's body around. These troubles, which rendered the ship incapable of being maneuvered while the guns were being fired, were finally overcome by offsetting the antigravity effect of the varium for an instant on firing, thus providing an adequate counter-mass for the projectile.

The matter of torpedo-practise offered no problem whatsoever. At Taussig's suggestion, sharks were used as targets.

The summer passed away with manifold activities. They insisted that each member of the colony attend several flights, although none of them shared their secret. Even the well-educated among them had no notion as to what made the mysterious craft rise and move along.

Meanwhile, the second vessel was being rushed to completion. The roof had not yet been erected, nor the windows placed. The electrical equipment had yet to be installed and the motor was under construction in the foundry.

One day Meixner was at the hospital while Lindner had taken off and gone on a hike with a group of colonists. Taussig was in his office, busily engaged. The wall of his office held a chart forty feet long, and about six feet high. A complex red curve was marked on it, covered with countless indices of six and seven digits. Taussig was ceaselessly pacing between the wall and his desk, on which lay a ponderous volume of his records. As Martin entered the room without being noticed, he was staring at a page of the records, then reached for a logarithmic table. After a moment he gave vent to a curse, hurling the little volume into the far corner of the room. Still unaware of Martin's presence, he went again to the chart and after a few minutes of intense peering at it, his features brightened. Stroking his forehead, he accused himself, "If I'm not the world's prize jack-ass!"

"The most truthful statement you ever made," laughed Martin.

"So you are here!" Taussig looked up in surprise. "When did you come in?"

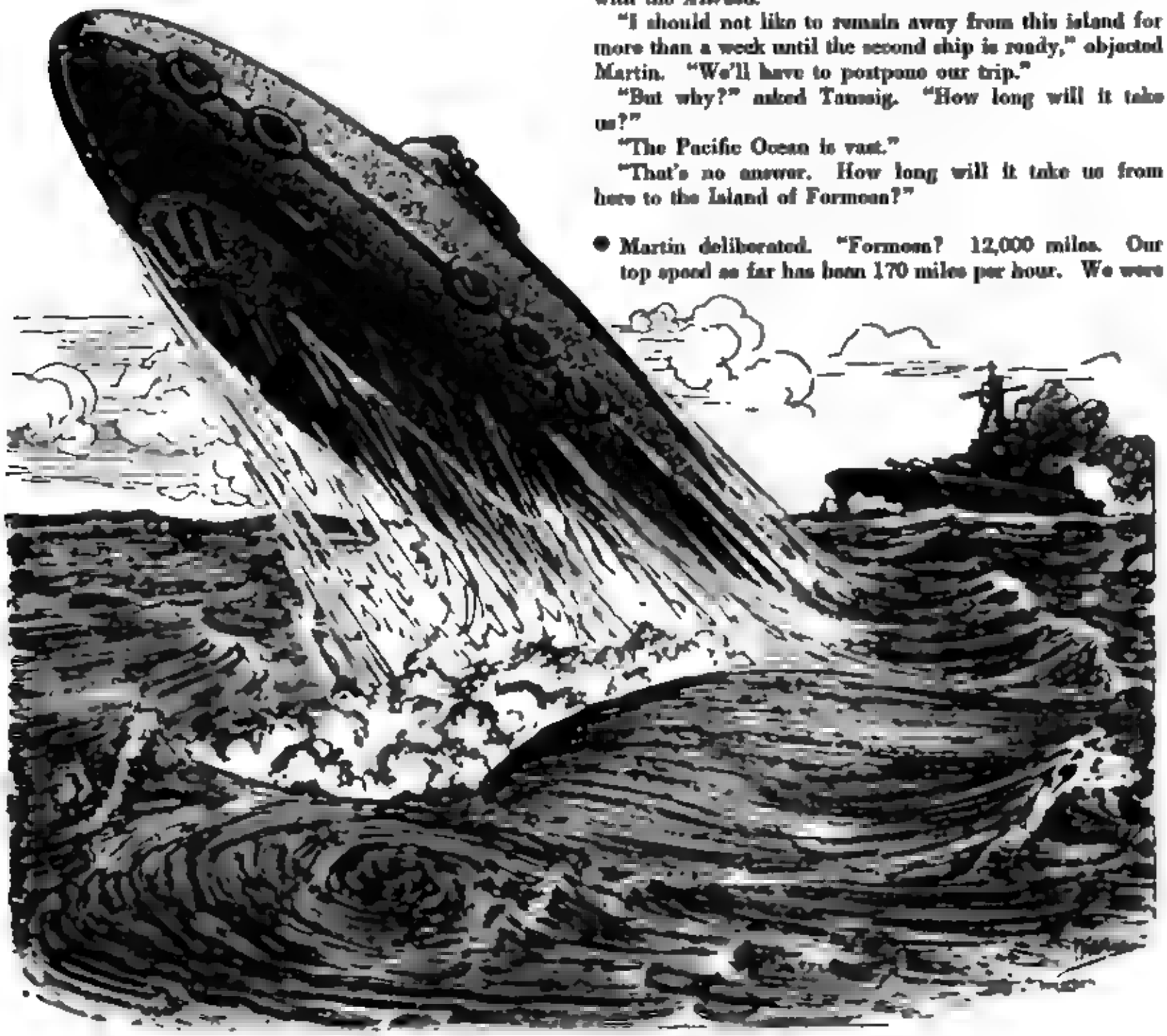
"Oh, quite awhile ago. I amused myself watching you run back and forth between the wall and the desk like a lunatic. What does this curve mean and its cryptic figures?"

"Give me another moment, will you please?" Taussig restrained him, "Let me take this down first. I couldn't afford to forget it, I'll be through in five minutes, and

then I'll be at your disposal. I've got to talk to you anyway."

"And I to you, too."

Tanzig quietly picked up his logarithm book and became absorbed at once in his calculations. He pondered his problem for fifteen minutes. Then he went again to the chart, erased a certain figure and replaced it with another one. Satisfied, he mumbled to himself, "Well, this thing is straight, at least in theory. As to the practice of it, we'll see. And now," raising his voice, "Governor, I am at your service."



Suddenly the passengers were almost blinded by the brilliance of the sunlight which rushed into their ship as they emerged from the ocean.

Martin lit his short pipe. "First, I want to report another find of varium. The Vanderlip Compagnie, in which I am financially interested, and which holds all kinds of mining privileges in Kamchatka, has sent a sample of the green mineral."

"Splendid! How extensive are the deposits?"

"That I don't know. The other question is: how to ship the sand over here? During the summer months, it could be shipped to Seattle, or Frisco, or to another Pacific port of the United States. From there one of my own freighters could receive it."

"And bring it over here?"

"That wouldn't be so clever, would it? Especially because it would be a matter of many hundreds of carloads, so I am informed. By hauling it from a Pacific port, we'll lose a lot of time. Shipping it across the continent, on the other hand, is prohibitively expensive."

"You just want to have a stronghold in the Pacific similar to the one we now have in the Atlantic. So do I, of course. We'll have to scout around through the Pacific with the *Astraea*."

"I should not like to remain away from this island for more than a week until the second ship is ready," objected Martin. "We'll have to postpone our trip."

"But why?" asked Tanzig. "How long will it take us?"

"The Pacific Ocean is vast."

"That's no answer. How long will it take us from here to the Island of Formosa?"

● Martin deliberated. "Formosa? 12,000 miles. Our top speed so far has been 170 miles per hour. We were afraid of maintaining that speed for a long time for fear that the shaft of the engine might break. Nevertheless, we could count on an average speed of 100 miles an hour. That means about 120 to 130 hours, or 5 to 6 days."

Tanzig snapped his head about. "I'll take the *Astraea* to Formosa within twenty-four hours without any damage. If necessary, I can do it in eighteen to twenty hours."

"How would you do that?"

"Answer me a question first: What movement does a

ship make lying still on the surface of the ocean?"

"None, I should say."

"Wrong. It follows the rotation of the earth. That is 15 degrees of latitude each hour."

"It also follows the revolution of the earth about the sun," laughed Martin, "which means eighteen miles per second."

"Right. But that does not concern us at all here."

"But the rotation of the earth does?"

"Yes, indeed. Suppose you rise one radius above the surface of the earth. That is about 4,000 miles. The *Astraea* would retain her original circular speed, but her orbit would be exactly twice the circumference of the earth, in other words, she would cover 180 degrees in the time that the earth takes to make one complete revolution. Our island and Formosa being about 180 degrees apart, the *Astraea* would stand over Formosa in just about twenty-four hours. If you have nothing better to do, you can start on your Pacific scouting tour tomorrow, and be back easily in three or four days."

"I do have something better to do. But coming to think about it, tell me how you are going to rise 4,000 miles. Our ship has a lifting acceleration of 15 meters per second squared. The principle of free fall, with only the direction reversed. If we go up for a certain length of time and then neutralize our charge, we'll start to revolve around the earth like a second moon."

"Provided we don't start to starve or freeze to death in vacant space."

"But we have already been in vacant space many times. On the very first trip, for that matter. The ship can stand the enormous pressure of 565 pounds as a submarine as I have observed. And then an inside pressure of only 15 pounds should be dangerous,—your objection is not substantial."

"I guess not. All right then, we'll get up there, but how? What's more, how will we get down again?"

"At our destination, that is above Formosa, we'll charge positive, thus acquiring more and more weight and consequently a downward motion. We can regulate the rate of descent very easily. It is easily seen that we'll take a little longer for landing than for taking off."

Martin held his head in his hands. "I don't understand a single word of your explanation, but I have to believe you since I experienced it myself when we rose more than three miles in a fraction of a minute. Answer another question for me: According to what you just told me, would it not be possible to pry into cosmic mysteries. Couldn't we reach Mars, or Venus, for instance?"

"I don't doubt the possibility of it at all."

"Really!" replied Martin agitatedly. "And here we are talking hardships and working like slaves to avenge our country, instead of finding new worlds for her."

"Avenge, did you say?" interrupted Taussig. "Not with me. Only to save. Revenge if 'they' insist on it, if they force it upon us. To me, the *Astraea* has always been a means of warfare only secondarily. In the first place, a space ship, a means of bridging space which separates us from our neighbor planets. This was my first notion at the time that I saw a piece of varium spring to the ceiling in Lindner's laboratory. That has now been twenty months. Since then, I have made a careful series of calculations about trips to the moon, to Mars and Venus, which are the three nearest heavenly bodies. Two weeks from now, for example, we should have an excellent opportunity to reach Venus which at that time will be closest to the earth."

"Yes, but how would you achieve the covering of all that distance? Don't torture me with too many technical details if you can help it."

"Very well, but I can't do without pencil and paper. Look here, then. The sun is, say—90,000,000 miles away from us. Venus, in her most proximate position, about 25,000,000 miles. We'll go up under positive charge until we have reached the limit of any appreciable terrestrial attraction, say about 25,000,000 miles from the earth."

"But what is that as compared with the enormous distance to be bridged?"

"But don't forget the great ultimate speed we will have attained then, at which we will continue to travel through space. Breaking the slight hold of the earth we could increase or diminish or maintain that speed."

"We would then be in the attraction of the———."

"Sun, yes."

"What does this amount to near the earth?"

"It amounts to an acceleration of gravity of .070 feet per second squared."

"And near Venus?"

"About twice as much. But this sounds like only a little, for after an hour you'll be falling at a rate of 150 feet a second after a day at 3,500 feet a second and after fourteen days, at 9 miles per second."

"How long will it take to get to Venus?"

● "There are several ways with different traveling times. Anyway, we'll have to arrange for hitting the Venus orbit at a tangent, at less than twenty miles per second. You can follow me thus far, can't you?"

"Certainly, but why in a tangent and not at a right angle?"

"Because we will have to avoid falling toward Venus, but aim instead at revolving about it like a moon."

"What advantage does that hold?"

"Very much. Venus has high and very dense atmosphere. While we have very accurate charts of the lunar crust, we know nothing of Venus' surface formation. In juxtaposition with the earth, we are facing its dark side, and in the opposite position, she stands behind the sun. We can only observe her, then, in her first and third quarters. We know nothing of her rotation. Some astronomers contend that the Venus day has about 24 hours, a group of others with Schiaparelli at their head, say she has no own rotation at all, being, in other words, a solar moon."

"What is the difference?"

"Well, look. Our earth is a planet. Every point of her surface faces the sun at certain regular intervals. A solar observer, unlimited vision being assumed, would be able to draw accurate maps of both terrestrial hemispheres. And take the moon now. No human eyes have ever beheld the other side of it. If Venus, too, is a moon, it would mean that organic life, as we know it, could not exist there."

"I can readily see that. One side would be intolerably hot, while it would be eternally cold on the other side."

"Correct," assured Taussig. "But since water vapor is proved to exist in Venus' atmosphere, its lunar nature is highly doubtful. All the water vapor on the dark side would immediately be solidified and thus disappear from the atmosphere."

"Do you think that Venus' atmosphere would be fit for human respiration?"

"I have no doubt but that it would. In observatories highly located, we have obtained the same spectral reaction of Venus' atmosphere as that of plain sunlight. It is the same type of light in both cases, directly received here, and reflected from there after having passed in either instance through two identically, or at least very similarly composed, atmospheres. For safety's sake, however, I shall take a spectroscope picture of Venus on our ascent into the stratosphere."

"You still must explain why it is desirable to have the *Astraea* revolve around Venus rather than to have her land directly."

"Very simple. We'll enter the shadow of Venus on our journey and we'll have no way of knowing how far we are from the surface, whether or not we have entered the atmosphere yet, and a thousand other things."

"I don't grasp your objections. Wouldn't the aneroid indicate the outside pressure, and the gravitometer tel' you whether we were approaching or getting away from the planet? These very things you employ in calculating your distance from the earth's surface."

"Yes, but only your absolute distance from sea level. Suppose your aneroid reads three miles elevation and you start downward at a rate of ninety feet per second You would recklessly beckon to death if you happened to be above Mount Everest, save for the fact that you would naturally inspect your territory first, a thing that Venus' atmosphere would make impossible especially at night. Here on the earth I could easily help myself in a similar situation. I should simply go up another 5 or 8 miles and wait for the sun to rise."

"That's settled then. I'm game, of course. How about the others? Will they come along?"

"You seem to take this things as a pleasure jaunt," cautioned Taussig. "You really shouldn't. A great risk is involved."

"Danger to life, I suppose."

"Naturally, and an enormous one at that. Our chances of coming back safe and sound are one in a hundred thousand."

"That is the attractive thing about it. To me, life means to fight for it. To know that danger is lurking is fascinating. Here where everything proceeds according to a definite schedule, where even a master must adapt himself to an established system or be cast aside,—what an existence!"

"I understand what you mean, but you can't realize the dangers that really await us. I don't either, but I can easily imagine them. A little crack in the shell of the *Astraea* and we'll be asphyxiated, a collision with a small meteorite as it streams through space, and there are thousands of them near the sun, would annihilate us. Some little thing could go wrong with the electrical part of the engine, and we would never get away from the sun's field of attraction. We would fall for days and weeks before we would meet our destruction.

"Our intelligence and courage could not prevent that. Hour after hour the red ball would grow huger and huger until it would occupy our whole range of vision. With merciless cruelty, the great life-giving star would take your life away. Imagine the tortures and suffering of one condemned to death, but his lot is infinitely better; he can always hope up until the very last moment."

"How vivid your imagination is! Your description certainly sends cold shivers up my spine."

"You know, I once figured out the orbit of a comet and made an error in my calculations, according to which the comet was to collide with our earth and cause its fall toward the sun. I had weird visions of the consequences. The cessation of all social order, a wave of suicide among one class of people, the unbridled instincts of another in full, uninhibited play, the religious frenzy of a third; an unimaginable chaos. I soon discovered my error but the hideous visions of the solar death kept haunting me for weeks and months."

"All right," said Martin, "is your imagination exhausted now?"

"Not by any means. Once you have overcome the dangers of space, even after you have made a safe landing on Venus, greater dangers are still to be faced. There, where the temperature is considerably higher and the humidity so much greater than on earth, we'll doubtless encounter monstrous representatives of a species of animals long extinct on our earth,—saurians of prehistoric times, for instance."

"It will be great fun hunting them, without game wardens nor hunting licenses to bother with."

● "I wouldn't be so sure about that. Your gun wouldn't be much use against 200-foot monsters protected by horn plates."

"Let's use cannon then. In the water, we could torpedo them."

"A nice conclusion to the life of a self-made man, to land as breakfast into the belly of a sea monster on Venus."

"There are worse things than that. At least it would be original. I should like to see someone from Fifth Avenue—. But why do you tell me such gruesome stories? Are you trying to scare me into giving up?"

"Far be that from me. I myself am dying to take the trip, and I can't think of a companion I want more than you. But I could not bear the thought of being responsible for any harm that might befall you."

"But, really, Taussig, I herewith solemnly promise never to hold you responsible for any accident that might happen to me, whatever it may be. After all, we are not taking this trip just out of curiosity."

"You are right there. Let's drop that for the time being. When you came in, you said that you wanted to talk to me about something. Shoot,—what was it?"

"Well, it's this: As you know, I am trying to realize on my real estate holdings in the United States. The chances are splendid at the present time. With today's delayed ship, I received two letters, one from New Orleans and the other from San Francisco. All that I have left of my real estate is in Alabama and California. According to those messages, I am supposed to confer with a prospective buyer in New Orleans on the ninth. That is the day after tomorrow, and on the tenth at 4 o'clock, my lawyer, Perkins, wants to close a deal in Frisco under very favorable conditions. My presence would be a great advantage on both days."

"Can't you have someone represent you?"

"If I had enough time, yes."

"Well, it is probably best for you to go yourself. Where is your appointment, in New Orleans?"

"At the Hotel Concepci[illegible]

"And in Frisco?"

"At Perkin's office."

"How do you want to manage landing and traveling on land?"

"I have thought of all that. Come along to my room, I'll show you."

"In just a moment,—I must lock these things up."

"You see," said Martin, seating himself comfortably in an armchair, "I thought that we might have trouble some time at sea and be forced to anchor in a port somewhere. I have prepared for such an occasion."

He handed Taussig an envelope containing documents. His friend leafed through them. "Oh!" exclaimed the latter, "our *Astraea* is a U. S. submarine then, a new type which is to be tested. Not half bad. The signatures of the Navy Department, and the seals, aren't genuine, though, are they?"

Martin laughed. "Not exactly. No one will doubt them though. It is official document stationery, and the signatures were made from enlarged photos of real ones. Here are some genuine signatures. Compare them. Use this pocket lens."

"Perfect."

"Here is also a general order from the Secretary of the Navy to all port officials, requesting them to give the commander of the *Astraea* all possible assistance, and here a special dispensation from the regulation report to the port official. These are the rest of the ship's papers and our officers' licenses. We shall be identified as four naval officers, I being commander Winston Johnson, you Samuel Webster; Lindner, Robert Smith; and Meixner, George Walker; all captains. The uniforms, too, are all ready. It goes without saying, that such a submarine on a try-out has a crew of officers only."

"How will we make a landing in New Orleans?"

"Very simple. We'll arrive by air on the evening of the eighth, outside of the harbor, and then go inside the harbor, afloat. We will display the official naval flag and go about our business without making an official report. If a harbor patrol insists, we will let them come aboard if they are officers, and show them our release from the requirement of making a report. Referring to secrecy of office, we'll refuse all further information. All three of you speak Anglo-American well enough, and being Prussian officers, you can certainly discourage any embarrassing inquiries by lofty manners."

"I have no doubt we could," smiled Taussig. "Do you have a list of the higher naval officials?"

"Of course I do. We will acquaint ourselves with it on the journey."

"In San Francisco you are going to work the same scheme?"

"No. I own a suburban home there. It has a huge park and is well off the beaten track. At the present time, it is occupied by a number of German emigrants who came from South America. They are bound for our island. Colonel von Rhaden is in charge of them."

"Oh, old Rhaden?"

"The very same. I'll wire him from New Orleans. He'll send up a few sky rockets and outline a landing place. We'll descend there after nightfall."

"Won't it be noticed?"

"What if it is? The park is enclosed all around by a fence. The next day I'll see lawyer Perkins and give him the keys. Rhaden will continue with his crowd to New Orleans where they will take the steamer."

"What about the varium from Kamchatka?"

"I think that we'll store that somewhere in Frisco until we know what to do with it."

"Then, where will you go, after you have attended to your business in San Francisco?"

"I shall return here, work on the construction of the other ships and prepare for the trip to Venus."

"Before we do that, I would like to suggest another trip. As you know, Lindner has been engaged for years."

"Yes, I know, but his financée could have come over long ago."

"He has to call for her himself."

"Why hasn't he all this time?"

"Well, you know that it would have been impossible for him to leave his work. I think that we owe it to the old pal to guess his wishes, to meet him half way and help him carry out his plans."

Martin nodded in consent. "There is certainly an eventful time ahead of us, but I feel up to the task," he added confidently.

CHAPTER IX

A Capture!

● It was the tenth day of the month at ten o'clock. The four companions were sitting on the veranda of Martin's villa in San Francisco. A hundred steps from them the *Astraea* was lying, partly hidden by thick bushes.

They had completed their journey exactly according to schedule. In New Orleans the official in charge of the port insisted on inspecting the boat himself. At first he had been a bit puzzled that an entry in the port records was refused, but the express orders from the Navy Department to refrain from formal reports finally convinced him. He realized the wisdom of such an order, knowing how actively spies from all over the world were at work. He treated the young officers with the kind of familiar respect characteristic of people in his position. Never did he suspect that there might be something suspicious about them and their story. He was not even greatly astonished when the submarine was found to be gone the next morning.

Lindner had sent his cable messages in New Orleans and San Francisco. He was now whiling away the time, waiting for his appointment with Perkins who was expecting his prospect at 4 o'clock. The four men were sitting together, clad in leather from head to foot, discussing their trip to the distant planet.

"Pardon my intrusion," the conversation was interrupted by Von Rhaden, a stocky man of medium height, "I am worried about your airship there. As I just walked by there, I had the impression that someone was moving about inside. So I looked through the window. I first thought that it was one of you, but now that I see you all sitting here—"

The four Germans rushed over to the airship before Rhaden had finished. Upon approaching, they saw a man trying to get away in great haste. A hunt for him was immediately begun in which Martin and Lindner, also Rhaden and some of his people, took part. Taussig finally caught him and dragged him to the ship despite his resistance. Just as they reached the ship, another man was trying to leave it by means of a rope ladder. The menace of two revolvers pointed at him, halted him. Hands in the air, he stood with a defiant expression upon his

face. Taussig whistled twice, calling Martin and Lindner, while Rhaden and a few others escorted the second captive into the house.

"Ah," said Martin, "it's you, colonel? Keep your hands up. Remember, I'll shoot at your slightest move. Search him for weapons and papers, men. Keep still for your own sake. Is that all?" Then in a loud voice, "Ludvig!"

A bearded, hostile-looking man, Martin's janitor, approached, a bunch of keys in his hand. With him came two big hounds.

"Monsieur Martin," spoke the colonel now, "I should much prefer going home."

"Not yet. I have to talk to you. But not for an hour. First I'll take a look at the ship and see whether it has any more visitors. I'll give you two of my men for company, and also Tyras, this cute little dog. Ludvig, take the gentleman to the small ground-floor parlor,—and I advise you not to make the least attempt to escape because Tyras is very well trained. To him a spy is a spy, even though he may function officially as a military observer."

"Herr Martin, for the last time I ask you to let me go on my way without any further delay. The consequences—."

"Oh, you are threatening me with consequences, are you? Go ahead. Re-occupy the Ruhr zone. All right, Ludvig, take him away."

The four men examined the ship. The other dog had been set inside through a window. Nothing aroused him to spreading any alarm so the men entered. The *Astraea* was raised a few yards from the ground, the motor started, the lighting circuit tested, but everything proved to be in perfect running order. All the locks were untouched. They were headed for the veranda again when suddenly the dog halted at some object lying on the lawn, giving a low growl as it did so. It proved to be a Kodak, which Meixner picked up cautiously and put into his pocket.

"Let's question the two intruders now, one after the other," suggested Martin. "Let's begin with the one we caught first."

Rhaden and some of his men brought in a heavy-set man. His face was flushed in anger, his hair disheveled, and his suit badly wrinkled. Beyond all doubt, he was an American. This was indicated by his appearance and manners.

Martin turned to Rhaden. "What did you find on him? Oh, I see, a loaded pistol, several keys, some master keys, and a notebook. Let's see that."

He skimmed through the book, examining its contents, scanning carefully every page, including many loose leaves. All the while, he seemed to grow more and more amused. "Then you are Mr. Tobias Brown, in the employ of Pinkerton as a private inspector? What was your business in my garden?"

"Although you have no legal right to question me, Mr. Martin," said the detective pleasantly, "I shall answer your questions, for, after all, it was your property. Well, you know my profession. In carrying out its duties, I was forced to infringe upon your property rights in following up a crime. May I ask you to remove these shackles now?"

"So you were on the trail of a crime? Has it been committed, or is it yet to be carried out?"

● "Listen, old chap," Taussig put in at this point, speaking to Martin, "leave this man to me. I think I'll get along with him much better. We can't afford to waste any time either. Let's unload the pistol. Here, Mr. Brown, take back all of your things. Let's take off the handcuffs, too. Please take a seat. Will you have a cigarette, or perhaps a cigar?" Talking to Martin again, he said, "Can't you see that this man is a gentleman? You are treating him like a gangster." Resuming his conversation with the detective, "I hope that you don't feel offended over Mr. Martin's mistake. Let's get down to business and be as brief as possible. Tell me, Mr. Brown, how much does the Colonel pay you? You see, I have heard of you before and I know that you are rated as being very capable in your line. Now that we have spoiled this job for you, you might welcome a new offer and a better one at that. But, name your fees first. I think that we shall have some excellent use for your services."

Obviously, the captive was undecided, as his nervous behavior showed. Finally he turned to Martin, "Can you guarantee the sincerity of Mr. Taussig's proposition?"

"Why, of course. Furthermore, the colonel will not be very willing to remunerate very generously for your services now that you have failed and he is a captive himself."

"Yes, about the colonel," replied the man in a worried manner, "I should emphatically advise you to turn him free, Mr. Martin. You'll find yourself in trouble if you don't. Consider that he enjoys international protection, being, as he is, a special officer of a foreign power. Even if his own country takes no steps in the matter, the United States will feel compelled to intervene."

"Thanks for your advice, but I'd rather take care of that myself. What do you think of my offer?"

"I am afraid that I could not accept it. You know, it would be different if I were employed by the colonel as a private individual, but as it is, I will have to stick to my assignment from headquarters or I'll risk losing my job. It would also endanger the connection of my house with the embassy to which the colonel is attached. You see, it is impossible."

Taussig smiled patiently. "I thought that you would be a little smarter than that. Would you think it impossible to remain in our cellar over night for $2,000?"

"I've been working day and night for only $200 a month."

"We would lock you up in our cellar together with your Kodak and films. Tomorrow morning you will be released and then you will report to your office, telling them that you were almost caught but managed to escape into our cellar, from which you escaped during the night. As proof, merely offer your films."

"You'll let me take the snapshots?"

"Certainly, they are of no value to us. Nobody can learn anything about our ship from them. But they will be of help to you in proving your story."

"What about the colonel?"

"Tell them that you have no definite knowledge concerning his fate. You had attracted attention, you will tell the office, and then tried to save the photographs and yourself from discovery."

"Tell me, though, what are you going to do with him?"

"You can follow that up tomorrow morning after we set you free. Oh, Martin, would you be kind enough to make out a check for $2,000?"

"Yes, certainly. Here it is, but remember, it will be honored only if your information proves to be correct.

That is why I dated it four days ahead."

Mr. Tobias Brown sighed deeply. "Well, here is what I have to say: For years my house has been connected with the European government in question. In 1919 we received an order to shadow the American citizen, Martin, and to report our observations to the colonel in Washington. For a long time we could not locate him. In May of that year, finally, you traveled from San Antonio, Texas, to New Orleans. I was in the same car with you. In New Orleans you disappeared in the hustling crowds at the harbor and your trail has been lost ever since."

"Why was I to be shadowed? What prompted the men in Paris to arrange for that?"

"If I say another word now, I will deliver myself completely into your power, Mr. Martin."

"I take it you are already in my power, so go on. Of course I'll make use of what you tell me for my own protection, but I will never divulge the source of my information, and as you may know, I'm as good as my word. If the value of what information you give me is worth something to me in excess of $2,000, we shall not hesitate to pay you the difference. Give me the news now. What have they got against me in Paris?"

Mr. Brown nodded. He was evidently determined to go through with it.

● "At the beginning of 1919, you were in Berlin. You visited the War Minister, a college pal of yours, offering him your money, your connections and your cooperation in anything that might help the German cause. At the same time, three German officers,—I've got their names down in my notebook,—presented themselves to the minister, offering him a new means of warfare which they claimed to have invented. It was a vehicle which, at the same time, was both a submarine and an airship."

"And they swallowed this hair raising hoax in Paris?"

Mr. Brown, too, was amused. "They are inclined to believe any hair-brained stories in Paris, and they are paying hard money for them, too."

"What did the Prussian War Minister do then?"

"He sent the officers away. But when Paris got interested in their whereabouts about a week later, they had disappeared. And so had you, Mr. Martin. For a time, Paris thought that perhaps London was in on the game. England has always shown real interest and aptitude for such things. When careful investigation along that line proved that our suppositions were wrong, Paris got in touch with us.

"We did all we could, cooperating with London, but remained unsuccessful. Then a strange message reached up from London one day. The commander of an English torpedo boat reported that off the Mexican coast he had seen a 60-foot submarine come out of the water and continue its journey by air, proceeding east-northeast at a terrific speed. I guess that it was the same craft in which you caught me."

"Yes, it was," confirmed Martin. "Tell me, though, how you finally caught up with me."

"In a very simple way," Mr. Brown went on, "I was amazed that a clever man like you would bite. Since you couldn't be located, a curious thing for a man worth 30 million dollars, your real estate holdings were closely watched. It could not escape us that within the last year, all of them changed hands, all except one plot in Alabama and this house in California. Then we made you an unusually good offer for them through a middle man, requesting that you be personally present, and setting the two appointments so close together that you could not have made the distance, New Orleans to San Francisco, on the best possible train or plane connection within the allotted time. Thus the European War Departments wanted to prove to the War Department of this country that your new craft was a reality, and not merely a rumor, as it has been thus far regarded by our aviation experts. So, then, it was agreed that a colleague of mine should shadow you in New Orleans, while I traveled to this place, together with the Frenchman."

"That is very interesting, indeed," Martin commented, "and certainly worth more than $2,000 to me," he added encouragingly.

"Then around midnight I had a phone call from my friend in New Orleans. You had made your appearance punctually at the hotel, closed the real estate deal, and then left for the harbor where a harbor boat received you. He tried to follow you to learn what boat you were going to take, but the marine guards would not let him pass. They gave some secret maneuver as a reason."

"Go on, please."

"Now I discussed our further steps with the French officer. We agreed that we go to Perkins' office this afternoon at 4 o'clock and take two federal officers with us. The colonel, you must know, had obtained an arrest warrant for you and your three companions. For your appearance would have been proof to our government that your mysterious craft really existed. Naturally, Uncle Sam would take quite some interest in a matter like that. The Frenchman's feelings were mingled, of course, if he could not get the new invention for France, he would rather see it in the possession of the U. S. than of Germany. The Americans, he reckoned, would scarcely use it as a weapon against France.

"However, the United States might probably use it against Japan or England, which prospect must have suited him fairly well."

"Maybe so," interpolated Martin.

"What made the colonel change his original plans to catch us at Perkins'?"

"This is how it happened. We were watching your house last night. While I was talking to the Frenchman, I had reports that red and blue skyrockets were being shot from your grounds, as if to guide some aircraft. This was unmistakable proof to us that you really had planned to cover the distance, New Orleans to San Francisco, in a few hours."

"And then?"

"The colonel decided to rush to the scene. When we had received that report, he asked me to join him in going there. We climbed over the fence and hid behind bushes. The park was lively with people. I almost attracted attention through the interest that one of the dogs took in me. I quieted him with a piece of sausage. Then, out of a blue sky, the airship came. The landing was really impressive. Not a sound in the air. Slowly it sank to the ground. Never had I seen anything like it. Now I suggested that we leave. But there were still some people around until dawn. Then they went into the house, except for the dogs. I had, however, made friends with the dogs."

"Why didn't you leave when the road was clear?"

"The Frenchman wanted to stay and send me home. Evidently he had a fanatical idea of stealing the ship. He

did not want me around and I told him that was his idea to his face. He tried his best to make me leave, but when he saw that I would not yield, he finally put up with me. We then went all over the ship, tried all the switches and levers, but the ship refused to move an inch. I was greatly relieved when I noticed that he could not manage the craft, because I would otherwise have been in an awful predicament."

"What happened next?"

"Oh, we made up. He was again the boss, and I his helper. We photographed all parts of the ship and searched it thoroughly. We tried to open the doors of the various closets, but failed. So here I am at the end of my story. We did not see anybody in the garden, and then tried to make our getaway. The rest you know yourself."

CHAPTER X

Strategy!

● Martin nodded. "Tell me where they suspected I might be during the time that you could not locate me?"

"I could enumerate all the various theories concerning your whereabouts for hours, Mr. Martin. Nobody ever hid himself as carefully as you did."

"Has anyone of you anything else to ask Mr. Brown?"

Martin turned to his friends. "No, let's get this over with. Your information is worth $4,000 to me. Here is the check for the difference. Now you will go into the cellar where you will be served food and something to smoke. Tomorrow, early in the morning, say at 1 o'clock, you can clear out."

"I should like to warn you that they might be around for you this afternoon at five if you don't keep your four o'clock appointment with your lawyer."

"Won't they miss the colonel?"

"No, they don't know that he went with me. But I should appreciate it if you would tell what you are going to do with him."

"Why?"

"I hate to think of being forced to do something later on that might greatly inconvenience you. On the other hand, I am under obligation to the Frenchman."

"I think that it will be best for you to report that you do not know whether or not the colonel has escaped us, and it might also be better if they don't find the kodak and the films on you."

Mr. Brown nodded in deep thought. Then he reached into his coat pocket and returned Martin's check.

"You've changed your mind?" asked Martin astonished.

Brown shook his head. "Oh no. But I do not wish to take the chance of having them find the check on me. Do you have an envelope?——Thank you. Now would you be so find as to have this mailed right away?"

The men waited in silence until Ludvig, who had taken care of the envelope, returned. On leaving for his basement exile, Brown turned around once more.

"It is noon now. I'll be your prisoner until five o'clock. Then I'll be free and shall again be on your trail. After all, I've got my orders and can't leave the Frenchman to his fate."

The four companions looked at each other.

"What will we do with the colonel now?" asked Meixner.

Martin wrinkled his forehead. "This is an awful jam to be in. Just as soon as I set the Frenchman free, he will convince Washington that I, an American citizen, am conspiring against the United States,—by the way, has the peace treaty between the United States and Germany been ratified yet?"

"What has that to do with it?" asked Meixner.

"But, man alive, can't you see that the States can confiscate all my property? This piece of ground, for one thing. It is worth millions."

"Don't set him free then."

"That might have even more serious consequences. The Pinkerton sleuth will know that we have either kidnapped him or done away with him."

"Let's take old Tobias along too. We'll let them off somewhere on our trip, say in Japan, or China perhaps."

"That won't work either," replied Taussig.

"Pinkerton will be after Tobias. The result will be the same. I am in favor of taking only the colonel. We'll let him off some place from where it will take him awhile to get back to a civilized country. But before he leaves, he would have to request of his embassy that they discontinue all further observation and hostility."

"How will you get him to do that?"

"Just leave him to me."

"What good would that be?"

"To gain time. Martin could sell his real estate holdings. As long as the Frenchman has no possible way of getting into touch with his office, he can't do us any harm. Since he is the one who gave the immediate order to the Pinkerton people, he could likewise stop their activities directed against us."

"What attitude shall I take then toward him?"

"Any that you see fit. I'll come in at the proper moment, but then, of course, you'll confirm whatever statements I shall make. Let's go to see him now."

They entered the room where the "prisoner" was provisionally residing. He was sitting at the table reading. At the door stood his guards. At the feet of one of them lay the large dog. Following each movement of the prisoner, the dog's eyes roved about vigilantly. Martin motioned the guards to leave the room, while the four Germans arranged themselves around the colonel in a semicircle.

"Mr. Martin," the colonel began haughtily, "you made me wait a long time. I must ask you to be as brief as possible. People are waiting for me."

"Well, they will wait some more."

"Surely you don't intend to retain me here by force?"

"You think then, Colonel, that I have nothing better to do than to release you right away?"

"Yes, I do, indeed. Don't forget that I am invulnerable by international law. Consider the consequences you might have to face."

"You are threatening me, are you? After having obtained an arrest warrant for me, you have opened hostilities against me and have no right for complaint if I defend myself, even though my methods of defense might not be pleasant for you."

"Then do what you think you must," replied the colonel in an aloof manner. "My country will take care of this affair."

● At this moment, Taussig broke into the conversation which had so far been conducted in French, saying in English, "I beg your pardon, but we must hurry. Furthermore, these gentlemen can't follow your conver-

sation in French. Permit me, colonel, to present Lieut. Smith, Lieut. Walter, of the U. S. Navy."

"I feel that I owe you an explanation." Taussig continued. "Martin and I own a plant for the construction of such ships. Under the auspices of the U. S. Government, we have built in an American navy yard this ship which we intend to sell to our sponsors. For obvious reasons we have avoided all publicity. The Navy Department has granted us the option of building these boats for other nations under the following conditions: We must sell the first ten to the United States, if this government does not reject the first one. We must notify the department of all our negotiations with other powers. The department has reserved a right to veto a contract with any power that it deems unacceptable. Also, the boats must be constructed on American territory with American help, and with raw material purchased in the United States. Is that correct, gentlemen?"

Lieutenants "Smith" and "Walter" nodded.

"Pardon me," said the colonel, "what you are telling me sounds so incredible, especially after the attitude that Mr. Martin first took."

"Martin? You aren't surprised at a German being a little irritable with you? As for incredible, didn't Armstrong and Schneider and Creusot do business with Turkey and Bulgaria during the war? To disperse the last of your doubts, these gentlemen will show you their official papers and the ship's documents. For formal reasons, the only ship has already been transferred to the U. S. Government. Well, consider your situation. On a U. S. Government vessel, you appear, you, the authorized representative of an allied government, which this country has saved from complete defeat. What do you intend to do? Secretly you wish to steal the boat. You have papers and warrants which unmistakably prove that you wanted to give the constructors a bad name with the government. It will make a splendid impression when we report these facts. They might become a moral weapon in the hands of our government when it sees the time ripe to rectify Wilson's inexcusable mistakes."

"Wilson's inexcusable mistakes?" retorted the colonel, bewildered. "What are you saying?"

"We are Germans, colonel, Martin and I. Without very definite indications in our favor, we should really hesitate to place our invention at the disposal of the United States. And now, colonel, we have said all we had to say. Of course, you are free and may go wherever you please. Here are your belongings. We shall leave soon, too. We'll just write out the report on today's incidents, and then start out. We have to do some more gun training. Tomorrow we have to be over Japan, day after tomorrow over Germany, and the day after, back again in the States."

The colonel took up his things. "Mr. Taussig," he began, obviously fighting with himself, "you have, at one time, reproached me for not having come to you frankly and openly. If I could have found you this time, I surely would have done so."

Now the colonel, a little more secure, continued, "Suppose I had found you and asked you to let me see the ship in operation?"

Taussig turned his head toward Lindner and Meixner, "If these gentlemen, who represent the United States Government, have no objection——."

Meixner spoke, "I see no reason why we should decline the colonel's request."

"Wait there," joined in Martin, "but I do object!"

"For what reason?"

"I am still the real owner of the ship, and you expect me to admit someone as guest who has set detectives on my trail, obtained arrest warrants against me, and shown a most hostile attitude toward me?"

"Pardon me, Mr. Martin, but I did not know——."

"And aside from that, what good would it be to have him along? France will never get one of these ships if I have anything to say about it."

"Excuse me," from Taussig. "Only this morning, we have discussed the conditions under which we might——."

"Please, gentlemen," said the Frenchman now, "let me apologize for my conduct toward Mr. Martin. I deeply regret my mistake."

Martin recognized the apology with a nod of his head. Taussig said, "We appreciate your apology, Colonel, but we must ask you to give definite orders to end your hostile tactics."

"May I have a pen and a sheet of paper?" requested the Frenchman.

Taussig pushed a button, whereupon Ludvig appeared. Taussig gave him instructions.

● Meanwhile, the colonel had finished his writing and handed the sheet to Taussig. "Will this do?" he asked. Taussig handed the note to Martin.

Now Ludvig appeared again in the door, this time accompanied by Tobias Brown.

"Now, Colonel," Taussig ordered, "you can give all your orders directly to Mr. Brown."

"Mr. Brown," began the colonel, "I have convinced myself that we are on the wrong track. The explanation given me by these gentlemen causes me to request your house to regard the matter, Martin et al, as definitely concluded. Here is a written order to that effect. Will you also be kind enough to notify my office? Inform them, also, that I am going abroad for a time on important official business. Your bonus will be paid to you in the same amount as if the whole thing had been a complete success."

The puzzled look on Brown's face was indescribable. It was an effort for the four Germans to refrain from hilarious laughter. Brown received the colonel's order while Taussig whispered a few words to Ludvig.

"What did you say to him?" Martin then wanted to know. "We'll let the Yankee go only after we've left. He is a great deal smarter than the Frenchman and won't bite so easily."

Ludvig had left the room with Brown.

"And now, gentlemen," started the Frenchman.

"If these officers have no objection," put in Taussig, "we shall omit reporting what circumstances were responsible for our meeting with the colonel."

"Thank you, gentlemen," acknowledged the Frenchman. "Would you let me know now under what conditions you would contemplate selling a ship of your type to the French Government?"

"We'll have all the time in the world to discuss that on board."

"Where are you thinking of letting me off?" the officer asked, walking across the garden toward the ship with Taussig.

"Somewhere on our way,—not in America if we can help it."

"Perhaps in Germany?" the Frenchman offered.

"Please don't take such a provoking attitude. The Rhine occupation is a painful wound on which you must not touch. We'll put you out somewhere else."

"Of course," the Frenchman hastened to assure him, "any place you think fit, that is, on a continent."

The two men boarded the ship. "Where are the others?"

"They'll be here soon. Here, Colonel, are our ship's documents."

He handed the Frenchman a number of sheets, turning on the secret switch while the latter was studying the papers. These were put away again. Martin seated himself at the controls.

"Do you know, Colonel, that we are old acquaintances?"

"I thought that your face was familiar, but I did not know——."

"We met once at the Café Anglais in Paris. It was the day when Poincaré had been elected President. Dressed in your uniform you came into the café where a German-French company was amusing themselves, exclaiming in bewilderment and excitement, 'Mesdames and Messieurs, something terrible has happened. They have elected this man, Poincaré. That means WAR!'"

"Yes, I remember now."

"Your announcement started a lively discussion. Several French gentlemen, among them yourself, expressed their respect and appreciation of the German Kaiser, and you especially regretted that France did not have a 'fellow like Wilhelm II,' as you phrased it."

"Quite possible. Many of us felt that way before the war broke out."

"Do you remember the suggestion I made half in jest?"

"I am sorry, but it has been so long——."

"I laughed and said, 'Why don't you make Wilhelm II your president?'"

"Yes, I do recall that. And do you remember that almost the whole Café Anglais thought it was not a half bad idea, a bit absurd as it may have sounded? We said that if this suggestion had been made eight weeks earlier, a majority might have been found to carry it. Instead of a war with Germany, we would have had one with England. For old Britain would never have stood by and——."

CHAPTER XI

Into the Stratosphere

● At this moment, Meixner, Martin, and Lindner entered the room. "Four o'clock," announced Martin, "let's go."

In a few seconds the ship jerked upwards. The foreign officer had clamped his hands to the sides of the chair. "This is like a sudden rise in a fast elevator."

Light was flooding into the room from below. The beautiful panorama of San Francisco appeared through the central window. The city with its high buildings, the suburban belt of garden homes, the winding bay with its glistening reflections of blue and white; were all spread out before their eyes. The craft had risen to about 2,000 feet, taking a northward course. The hills already seemed very low, and human habitations looked like toys. The ship was steadily gaining altitude.

"Why the northward course?" Martin asked.

"Well, aren't we headed for Vienna which is about 650 miles north of San Francisco. But you are right. I can go north later."

Now the nose of the ship swung westward toward the ocean; "You won't get me to the coast of Asia overnight at this speed," the Frenchman expressed his doubt.

"I guess not. Now for our gun training. If only I could find a suitable target for a shrapnel shell."

Martin arose and joined Lindner in the front chamber. "Left hand gun ready," reported the former.

The airship had almost reached the water, still flying at high speed in a north-northwest direction.

"If only I could see some kind of target," Taussig repeated.

"Stop," ordered Martin.

The speed was reduced. "Your craft is far more dangerous as an air weapon than as an airplane," judged the Frenchman. "It can rise without a running start, likewise land in any place, and the greatest advantage of all,—making no noise whatsoever. The enemy receives not even the slightest warning. It is much more effective even though it might have to be confined only to bomb dropping."

"Why did you command 'Stop'?" Taussig asked Martin.

"I saw something afloat on the water. We have gotten more than a mile north of it now."

The *Astraea* was lowered to 100 feet above the water and turned about. Then slowly they went back, searching the water's surface. Then, "There, there," exclaimed the Frenchman, "it looks like a large steel ball."

"A vagrant mine? How did that get there?" wondered Meixner.

"The war between America and Japan, inevitable as it is, seems to be projecting its shadows."

"Do you think so?" eagerly asked the Frenchman. "What about England?"

"England will do everything to prevent such a war, in which she would have to side with the enemy of her former ally for well understood reasons. But let's quit discussing international politics and blow up this mine. From what height shall we aim at it?"

"1,500 feet," suggested the colonel.

"All right with you, gentlemen?" Taussig spoke to Lindner and Meixner in English.

Lindner, apparently absorbed in pleasant cogitation, did not answer. Meixner, however, quickly recalled that he was posing as an American officer, and inquired at some length into the subject of discussion, finally giving his consent.

"How do you aim?" the Frenchman asked in obvious interest.

Taussig explained the ingenious mechanism and technique of aiming to the colonel.

"Very clever," admitted the latter, "Who devised it?"

"I did. I am an artillerist."

Now Taussig was busy at the aiming telescope for two minutes while the colonel could scarcely control his nervousness and keen expectancy. Now the finger on the key went down. At the same time, Martin's hand threw the control wheel all the way to the left, and then back into its old position, all within a second, thus giving the craft its full weight for an instant.

A shock made the vessel tremble, the vision of a white cloud appeared, and in an instant a violent explosion followed.

"Magnificent!" glowed the French officer almost rev-

erently. "Such a small target at this distance. With this weapon, the war is won for America. It would be a crime for the United States not to start something within the next three months, now that they possess this great invention. I, for my part at least, will inform the Quai d'Orsay immediately and advise them to enter into a treaty against Japan if they have a trace of common sense left. It might endanger our Indo-China, but the Japanese fleet would soon simply cease to exist."

● Taussig grinned and winked to Martin. "Now we'll let you see our ship in operation as a submarine. Some ships can be more effectively attacked from below."

"I haven't much use for submarines," the Frenchman told him. "They betray their presence too easily. By their periscope, the oil layer on the water, gas bubbles, and the hum of the engine."

"But that is not the truth about ours." objected Martin, coming back from the front chamber. "Our motors work noiselessly; there isn't a drop of oil, and no gas bubbles can betray us. The position of the periscope is also very deceiving."

The tower and the exits were closed. Taussig stood before the eyepiece of the periscope. While the ship's nose was heading for the water, he adjusted the lense to accommodate his eye. The waves rushed open and swallowed the body of the ship. In rapid succession, the color inside the cabins changed from light green into dark green and then into black. Lights flashed on and the ship was brought into a horizontal position. Lindner and Meixner returned from the control room.

"If we turn on the outside lights, we can see the water for twenty feet, brightly illuminated. The floodlight in front can penetrate 150 feet of water. The pressure is 45 pounds per square inch, therefore our depth is about 100 feet. Nobody on the surface would suspect that there is a U-boat down here."

The outside lights were turned on now. Taussig, too, joined the group.

"Can the controls be abandoned without danger?" their guest asked in wonderment.

"Yes. It is perfectly safe. Let's take a look at the marine fauna. They will all flock to the light like insects."

A marvelous spectacle awaited them. Hundreds of different species, myriad colors, exquisitely beautiful,——! Nobody spoke a word for ten minutes as they remained under the spell of Nature's deep-sea beauty.

Then there was a sudden passing into the dark. In a moment, not a single living thing was in sight.

The colonel directed a questioning look at Taussig.

"Aha," ejaculated the latter, "a shark?"

"Yes?"

"You landlubbers have never seen the king of the seas in all his hugeness and glory. All you can see are the rear fins, the head and part of the body. But you can fully appreciate him only if you have seen him under water."

Martin called the colonel's attention. "Look there, a beautiful specimen of a hammer-head shark. At least 15 feet long. He is following us. Let's get ready to chase him."

Suddenly the lights went out, then a rustling, and again the rooms were filled by the light of a waning day.

"Pardon me," Taussig was speaking, "but the sun is down and we really have no more time left to waste on hunting sharks. We have just three minutes to fill our lungs with some healthful sea air. Let's open the tower, then, for a minute. Is the calcium chloride apparatus ready, and are the oxygen tanks in order?"

The sun had just sunk below the horizon, offering a beautiful spectacle of sundown at sea. The colonel stood absorbed in the sight. "How long it is since I have seen a sundown. At this time I usually slave over papers at the office. Isn't this grand?"

Martin gave the exits and the tower the once-over. "Everything O. K.," he reported.

"Would you like the sun again today, Colonel?"

"How on earth would you——?"

"Just watch me."

With a jolt, the ship began to rise. The surface of the water grew more and more distant, finally disappearing altogether.

"I can't see the clouds any longer. We must be in the clouds."

A flaming line became visible in the west, not unlike the narrow ribbon of a crescent moon.

"The sun is rising in the west," marveled the colonel, "or am I dreaming?"

The sky was very dark, the stars shone in the splendor never before seen, and the sun rose higher and higher.

The men remained silent for awhile. Then Lindner asked, "How high up are we?"

Taussig cast a glance at the instrument. "52 miles."

"Look," Martin pointed, "the Southern Cross down there. I have never seen it before in such a northern latitude."

"Isn't the world glorious?" beamed Lindner.

In silence the five passengers drank in the astounding sight spreading infinitely through vast space into which all eyes peered in wonderment.

The temperature in the cabins had climbed intolerably high. The colonel was first to comment upon it.

"Yes," agreed Martin, "it is the sunlight. Little as we get, nevertheless it is very effective up here outside the atmospheric belt."

"I don't know how to thank you gentlemen for this trip. I am speechless as I marvel at wonder after wonder."

"What is our altitude now?" Lindner asked again.

"About 350 miles."

"How can you tell that?"

"Here on this indicator. You'll find the distances from the earth's center and from water level, respectively, marked on the scale."

"How much farther up shall we go?"

"Just a few more minutes. Then we will switch to discharge and slow down our speed."

"What then?"

"We'll just keep that altitude until we land."

● The sun was still rising. The vehicle stood suspended in space without any motion of its own. On earth, the bright ribbon of sunlight grew brighter each second as it rapidly widened, while the zone of dusk was gradually disappearing. All about them was complete darkness, broken here and there by the twinkling of stars. Inside the ship it was bright and unbearably hot from the merciless, undimmed rays of the sun.

Taussig put the control wheel into zero position.

"The sun still seems to be rising," noted Lindner.

"Yes," affirmed the commander, looking at the chronometer, "it will be for another ten minutes."

The passengers were aware of no motion at all within the vehicle. It seemed to be perfectly at rest. Only the low drone of the stabilizers was audible.

Then the sun began to go down, shining on the ship's body from below.

Taussig announced that the upward motion of the craft had ceased. For some time, the passengers had felt a feeling of increased muscular power. This feeling grew more pronounced now that the acceleration of the craft had stopped, and the only downward pull consisted of one-fourth of the gravity pull on the earth's surface. The ship had reached the scheduled altitude of one radius above sea level. The illuminated sickle of the earth became smaller until finally all of it was wrapped in darkness. This unusual aspect of a sunset lasted for more than twenty minutes. The earth now gave the impression of being a faintly shimmering, huge ball.

"It's strange," said Lindner to Meixner in a low voice, "this is the third time we are making this journey, yet I'm as thrilled as I was the first time."

"It's getting cold," remarked their guest. I never expected to encounter such a temperature when I set out for Frisco."

Taussig brought him a fur coat. "Put this on. You'll need some more. We must still make provisions for such emergencies and install a few electric heaters. We have only two hot plates now. All the current is now consumed by illumination, and there is no heat to speak of in that."

Saying this, he turned on all the electric lights in the ship. Although all the electric power was going into the lamps, they were burning rather dimly, another manifestation of the diminished gravity upon which the operation of the vacuum motors was based.

"What are we going to do out in space? We won't have any energy available for heating and lighting."

"I am afraid that we won't be in need of any," answered Meixner. "You'll have more heat and light than you can ——"

"How about a cup of tea?" Martin began to busy himself with its preparation.

"Let me ask a question." The colonel turned to Taussig. "You said that by tomorrow we would be over Japan. Although the ship has ascended high enough, it has not moved at all for some time."

Taussig smiled indulgently. "Don't worry about that, Colonel. I'll keep my word and show you the Japanese Isles in just a few hours. Look at this globe,—here is where we are now."

He pointed to a place somewhere in the air above the northern hemisphere.

"There?" asked the Frenchman in wonder.

"Yes."

"But on earth?"

"We are not on earth as a matter of fact, but almost 4,000 miles from its surface."

The colonel appeared incredulous. Obviously he had some doubts as to the sanity of his host. Why, just an hour ago they had been 100 feet deep in the water and now they were 4,000 miles from the surface of the earth. Not even his ingenious fellow-countryman, Jules Verne, would have dared to present such a fabulous tale to his readers. On the other hand, what a technical masterpiece was this submarine-airship, he admitted to himself. What a genius, what a host of knowledge must have been necessary to make possible the building of it!

CHAPTER XII

Around the Earth

● Taussig could see the conflict of opinions on the colonel's face. "You are probably undecided now whether to take me for a potential asylum candidate or a technical genius. Well, let's not discuss that up here. What is your general opinion of the ship as a means of warfare?"

"It's unique beyond all doubt. Allow me to refer back to a former discussion we had here. You said that France might have a chance to acquire this invention, too. Under what conditions?"

"Under the condition that your country changes its policy toward mine and adopts a humane attitude of letting us live."

"But we are not killing your people now."

"No, not directly. They live, all right, despite your persecutions, your atrocious, despicable and inhuman acts of extortion, despite, also, the black occupation army, and the crime of Versailles. But how they live? Our workmen are starving, our younger generation is falling victim to rickets and tuberculosis by the thousands, as a result of your policy. Our citizens have no means of properly protecting themselves and their property from ordinary and political criminals because you will not permit such self-protection."

"Well, that is the fate of the loser. You started the war and ——."

"Let's not discuss that subject," Taussig cut him short, "but I still have a vivid memory of the young officer breaking into the party at the Café Anglais, and exclaiming excitedly: 'Poincaré, that means WAR!'"

"With that remark, I only meant to imply that the Republic had elected a man who was no longer willing to put up with incessant provocations of the martial House of Hohenzollern," the Frenchman defended himself.

Here Martin broke up the heated argument. "Tea is served."

They settled down for tea but a general conversation could not be started. Lindner lost himself in dreams of his future happiness in his approaching marriage, and as for the rest of the party, they felt uneasy because of the stranger.

"Gentlemen," spoke Taussig after awhile, "it's time to go to bed. Who will take the first watch?"

"I don't think that I shall be able to sleep," assured the colonel.

"I am sure that you will sleep soundly until we awake you in the morning," Taussig promised significantly.

The guest was led to his berth in one of the chambers. After bidding him good night, Taussig switched on a varium filament vacuum tube. "That'll be enough to make him sleep," he muttered to himself, turning on the current so low that the tube just barely glowed.

The others soon followed the colonel's example, and after a few minutes, the regular breathing of his companions was the only sound that Lindner could hear at his place before the controls. Pensively he looked into the star-decked sky. Through his mind ran all the events since the day he had first seen a piece of varium fly to the ceiling under the influence of Taussig's static machine,

up to this present moment of elation and crowning success. He thought of his fiancée in Austria into whose arms this journey was ultimately to carry him, and who would probably be waiting impatiently for him. The greater and more important things yet to be accomplished came also into his mind—his aim to help lift Germany, his country, from disgrace and misery.

With all this dreaming, the hours slipped by quickly. The altimeter indicated an unchanging altitude. Lindner also checked all the aneroids, which showed a constant inside pressure of 15 lbs. per square inch.

The moon was just sinking below the horizon. The earth could no longer be discerned in detail. Only a huge black circle in the twinkling sky testified to the reality of its presence.

Again Lindner fell into meditation. What glorious hours they had had, thanks to their invention! Yes, living was indeed a joy. There was a path and a goal. Work, loads of it! He could not help thinking of his unfortunate fellow-men in Germany, who, after such an heroic effort, had to face futility and the claims of enforced idleness. All the exhilarating and desperate moments of his service on the front were revived before his mind's eye.

Suddenly, his eye caught a bright beam coming from below. It was the first ray of the rising sun.

Lindner woke his comrades noisily to let them share the incomparable spectacle of a sunrise from a stratospheric altitude. No one would ever choose to sleep through such grandeur.

"Great Caesar!" expostulated Martin, after the first wave of excitement had waned, "just look at the water pitcher. Frozen! And it's hot as blazes here in the cabin."

"A quick change, indeed," added Taussig. "Have you looked at the thermometers during the night?"

"Yes, several times I read 31 degrees Fahrenheit below zero, in spite of all the lights burning. We simply will have to equip the ship with stoves."

"Yes, and also a layer of translucent glass over the floor window to lessen the effect of the sun's rays."

● The men got ready for breakfast, and Taussig relieved Lindner at the controls. "You can't make out any details of old Mother Earth yet. But it certainly glitters and glistens brilliantly. Probably the ocean."

"Let's turn off our varium tube, or the guest will sleep through the whole journey."

"If only we were rid of that fellow," grumbled Lindner.

"You'll have to take care in getting rid of him," said Taussig, addressing himself to the two "American" officers.

"Let's get breakfast ready now."

"Meanwhile I'll wake the Frenchman," Taussig said, going into the other cabin.

After awhile, the Colonel entered, bidding good morning to everybody with traditional French politeness.

"Now look there, Colonel—your Japanese Islands," pointed out Taussig, "Korea, the Japanese Sea, and the Yellow Sea."

"What is that jumble down there?" inquired the colonel in a surprised tone.

"That might be the Philippines," informed Taussig, consulting the globe.

The colonel stroked his forehead in profoundest perplexity. "Liners take two weeks from San Francisco to Yokohama. Last night I was in Frisco, and now Japan lies below us. Pinch me so I am sure that I am not dreaming. Otherwise, I will think that I have lost my sanity."

He divided his attention between the parading panorama below and Martin, at whom he cast many inquiring glances. The latter was too busy preparing coffee to pay any attention to him.

"Well, gentlemen," he announced shortly, "here are coffee and cookies, bought in New Orleans day before yesterday. Also butter and jam, and good cold water."

During the course of breakfast, the colonel evidently recovered from much of his amazement. Nevertheless, he resumed his place of observation at the window immediately upon finishing his breakfast.

"We have already passed Japan," he repeated several times, "and we are nearing China rapidly. Did you say that you could land anywhere and anytime you choose?" he resumed his conversation with Taussig.

"Why, of course."

"And you can build any number of these ships?"

"Certainly, as I have told you before, but why do you ask?"

"It is quite obvious. You are revolutionizing the whole technique of warfare with your invention. There will no longer be a belligerent front, nor communication lines behind the front, nor any mobilization of troops. If we can transport a whole division from Paris to London, let's say, in a single day, how would England have a chance to defend herself? Seriously, though, how much would you ask for a number of your ships? Name definite conditions, please, on the basis of which a discussion would be possible."

"But won't you realize, Colonel, that I could not possibly place a weapon like this in the hands of a power which, very likely would fight my own country with it?"

"I think that a war between Germany and France is out of the question for many years to come. At least we are doing everything to avoid it."

"Certainly, except that the Germans think your present methods of forestalling such a possibility are intolerable. The only reason that they are not at war with you, is because they do not have the necessary power to engage in war."

"Well?"

"You would have to bring about such a state of affairs that the Germans would not want to go to war with you, even if they were able. Believe me, this ship is not the only weapon, or the most effective, which we are secretly preparing in our country. You learned of this one only by accident. The other you will become acquainted with when they are used on your fellow countrymen."

"You are frightening me," said the Frenchman. "The general sentiment of revenge is growing daily in Germany, too, and what can we Frenchmen do about it?"

"Honest reconciliation and forgetting."

The French officer shook his head. "Sounds too Utopian so far as your belligerent countrymen are concerned. Just as soon as Germany gets back on her feet again, she will attempt to defeat us in war. Don't mind my talking so bluntly about this delicate subject, but I am talking as one soldier to another, as man to man.

"As I said then, that is our sincere belief in France. We just can't imagine a country like yours becoming resigned to the role that the Versailles Treaty forces upon her.

Also, believe me, that we French officers often dislike the methods employed by our statesmen in dealing with Germany, but we are forced to realize that there is no other way."

● "You will only hasten the collapse of France," retorted Taussig. "Every technical progress, each new invention which a German, be it in Germany or elsewhere, may develop, will be exploited as a weapon for the liberation of Germany."

"Then be kind enough to name some other way that a future conflict between our countries may be averted, if you can think of any."

"I certainly can. Re-establish the empire of Charlemagne."

The Frenchman was completely taken aback. "That is absurd!" he gasped.

"Absurd? Why? Yesterday I promised to show you the Japanese Isles at breakfast time. You shouted, 'Impossible!' After all, what is impossible if man sets out to really accomplish it? Or can you propose anything less absurd to establish perennial peace between France and Germany?"

"Germans and Frenchmen could never get along in one federation of states."

"What about Switzerland?"

"I grant that, but even so, how would you accomplish it?"

"By referendum, or plebescite. France and Germany, with their states, would unite under one federal government. France being the stronger at present, she would have to take the initiative, of course, and be as fair as possible. The territories, which are now the cause of all the hostility, Alsace and Lorraine, I mean——."

"Would have to be returned to Germany, I suppose." There was sarcasm in the Frenchman's tone.

"Far from it. They would become independent states within the union. Would not Strasbourg be just the place for the seat of government, for the Presidential Office, the Ministries, etc.?"

"What about old Britain? You don't think for a moment that she would stand for such a menacing alliance?"

By way of answer, Taussig pointed to the control wheel. "With one of these ships, we could force England to her knees. But you are right; England is a sore spot in such a scheme. For hundred of years she has fought for supremacy and she has been especially hard on you. Napoleon realized that, and so did William II, but they were not up to the task of stopping Britain. Don't you see that England is preparing for another blow; she will probably take advantage of the situation and side with us against you when the time comes. Don't you see that she is lining up with all the rest of them against you?"

"How do you mean?"

"In a coalition."

"What coalition?"

Taussig went on and on with his political discussion with the Frenchman, the importance of which need not be emphasized here. Then finally, "And then France will have another 1813 and 1814, and not even the genius of a Napoleon could help her."

"When," smiled the colonel, "will all this happen?"

"Sooner, perhaps, than you might think. You have crushed Europe to pieces to dominate them more easily. But those very pieces will unite against you very soon, because they refuse to be governed from Paris and England. Still the reins in both countries are held by men sharing common memories. How much longer will they last? There is only one salvation for you. An alliance with Germany. If none of your countrymen can think of this idea, why don't you be the first to broach it? Put it up as an issue in a public campaign and hold a referendum after three months. What do you think the results would be?"

"Frankly, I don't know."

"You mean, you're convinced."

"No, no," the colonel hastened to assure him, "the idea is too new to me as yet, that's all. One can't form an opinion on such a fateful question after a mere hour's discussion. The thought is ideal and beautiful, and worthy of a victorious nation like ours. But do let me go over the whole thing once more before you ask me for my opinion of it.—Ah, India!"

The craft was now above the Chinese Mountains. In the north, the eye was caught by the Siberian Steppes as far as the polar night would permit. Toward the south, the Bengal Bay was discernible, while the south ends of the two Indies were hidden by the curvature of the earth.

CHAPTER XIII

Off to Venus!

● The colonel, usually so active and agile, was staring motionless before him, reminding one almost of a dreamlorn Indian God.

"Do you really think such a Franco-German Federation possible?" asked Martin in a low voice.

"Certainly, if on both sides a few very prominent people sponsor the plan and campaign vigorously for it with all their influence upon the public mind. Newspapers, lectures, parliamentary speeches, the movies. You can suggest the greatest nonsense to the masses: Crusades, Marxism, Communism—why not something really sensible and useful for a change?"

Soon the Yellow Sea in the east was disappearing from sight. European Russia far beyond Moscow hove into sight. The outlines of the Caspian and the Black Seas grew plain. The Plateau of Iran, the peaks of the Himalaya Mountains and the Caucasus, the Persian Gulf, Mesopotamia, Asia Minor, Cyprus, the Nile Delta and parts of the Mediterranean."

"I feel," commented Meixner, "as though I were returning from a long journey. Down there in the south, the cradle of civilization, and toward the west, Europe, our home"

All busied themselves for awhile becoming absorbed in the vista until Martin called them for lunch. They all sat down to a hearty meal of cold meats, with biscuits for dessert. They did not even have to do without a real demi-tasse of Mocha coffee. The cigars and cigarettes had been lighted when, to the southwest, the Mediterranean grew visible as far as Tunis and Sicily.

"We are over Turkestan," said Taussig, winking to Meixner.

"Colonel," the later began in English, "I reckon it is about time for you to take your leave of us."

"Pardon?"

"My colleagues and I, after hearing some of your remarks, have deemed it inadvisable to have you continue this journey with us any longer."

"What were those remarks?"

"That makes little difference. But we have decided to retract our consent to having you as guest. I am here in the capacity of an American officer aboard an American vessel, and as such, I do not intend to keep you aboard. It is neither wise nor desirable."

The Frenchman rose in proud dignity. "Just as you wish, gentlemen."

Here Taussig intervened. "Lieutenant, it is impossible for the colonel to disembark here. One opening of the doors 4,000 miles above the earth, and we'll all be asphyxiated."

Here the colonel became frantically excited. "You think that I have not caught on to your foul game yet, don't you, you curs. These two rats are trying to impersonate American officers. You are all Germans, damned huns like all the rest of them. And you want to take this confounded ship to your country of barbarians and put it in some secret munition depot, until the time has come for you to leap at us again. But no, you're mistaken, you blackguards.

"Your damned country is not going to get this ship. I'll prove that a real Frenchman is ready at any time to sacrifice himself for his country. I'll destroy this ship and you rotten huns will plunge to Hell with me. There!!"

Saying this, and almost breathless from excitement, he raised one of the heavy quartz pitchers from the table and drew back to hurl it at the center window. But before his arm came down, the colonel suddenly collapsed, seemingly lifeless, the pitcher crashing to the floor.

"Excellent!" commended Taussig, admiringly. "You threw the switch for the varium anaethetizer just in time. Another second and all of us would be zooming to Hell."

"It was our salvation," put in Meixner, "that these sons of the *Nation Grande* can never do anything without giving a dramatic speech first. Well, let's go down now, put him somewhere, and let him shift for himself."

Taussig turned the control wheel to the left, giving back to the ship some of its natural weight. After a very short while, Meixner reported an altitude of only 3,000 kilometers.

Here Taussig slowed down the ship's fall, carefully checking the speed. The view narrowed, the Mediterranean sank below the horizon, also Italy and Greece. Only snow and ice were seen in the north now.

"How high up are we now?" inquired Taussig.

"Around 960 kilometers."

The earth drew nearer and nearer, the speed of the downward movement decreasing all the while.

"Let's do this a little faster," urged Lindner impatiently. "We have been descending for a solid hour now."

Taussig negatively shook his head, proceeding with utmost care.

"What a change for the worse!" sighed Martin. "Europe right before our eyes just a while ago, and now nothing but these dismal Asiatic steppes."

"This man," explained Martin, "costs us at least two hours. Where are we now?"

"Kilometer 95."

"Well, that isn't bad," muttered Meixner to himself.

"Ninety," came the report.

● Taussig again slowed the fall of the ship, and Meixner reported single kilometers down to an altitude of fifteen kilometers.

"Where now? the ship has stopped falling."

The Black Sea, too, had disappeared from view. Before them lay the Aral Lake, towards the west the Caspian Sea and the Caucasus Massive.

The *Astraea* was racing through the atmosphere at full propeller force, its nose turned slightly downward.

"There's Chiwa on the left bank of the Amu Darja. We'll let him off somewhere near that town. Has he got all his papers and his money? And let's stick a visiting card in his pocket."

"What'll I put down?" asked Martin.

"*Au revoir.*"

"Signature?"

"*Les quatre boches.* There is an ideal landing place. Fix up an iron ration for him: some bread, canned meat, a bottle of wine, and some cigars."

The *Astraea* alighted in a region sheltered by dense woods, about a half mile from the gates of the town of Chiwa. The spot was next to the old caravan trail, where, from the days of Kings Cyrus and Cambyses, lively traffic had reigned until only recently. Only at the dictation of the proletariat were the traffic, the commerce, and the trail killed. Quietness and desolation everywhere, while the midday sun was beating with sultry hotness upon the [illegible]

They lifted their sleeping guest out of the ship and placed him comfortably on the ground, his provisions beside him. They hurried back to the ship. In a few minutes the *Astraea* had again vanished into the infinite blue of the skies.

* * * * *

After Lindner's wedding, the four companions had only a few weeks' time to equip themselves for their journey to the distant planet. Weapons of every description, oxygen and carbon dioxide tanks, calcium chloride to bind the excess CO_2 in the exhaled air, and food supplies for two years.

The interval between the conjunction of Venus was about 600 days. The spectroscopic examination of Venus' atmosphere which was made from the outer atmosphere aboard the *Astraea*, had shown a denser air than that of the earth, though similar in its component parts. Water vapor could also be detected in it. On landing, doubtless they would be able to breathe and find water, too, but it was highly improbably that they would be able to find nourishment to tide them over for twenty months.

They had no intention of returning until they had secured an accurate picture of Venus' geographical and geological structure. So, they provided for a twenty months' stay. Martin suggested that some dogs and a few pregnant hogs be taken along. The extra chamber was, therefore, converted into a dog kennel and pig pen. The most spacious cabin was furnished as a living room and bed room.

A thick sheet of blackened plate glass, on wheels, was placed before the central windows to ward off excessive radiation from the sun whenever desired.

Again and again they thought of new articles that might prove indispensable. Decisions on such matters often came after lengthy discussions. Taussig had insisted that the fixed load should not be exceeded.

When everything was ready, Lindner threw a bombshell in the form of a request to be permitted to take his wife with him. The others emphatically declared against such a move, and firmly told him to remain on the earth

if he were not able to join them alone. After this ultimatum, Lindner had decided to stay on the island and supervise the building of the other airships, but thanks to Emilie's persuasive power, he finally changed his mind.

All preparations had at last been completed. Herr von Rhaden had been designated Señor Ramon's substitute. After long, deeply moving farewells, the four men mounted their ship to taxi it to a suitable starting place from which they were to take off on their interplanetary journey. After a final careful inspection of the *Astraea*, they ascended at 10 A. M., taking a leisurely south-southeastern course at an altitude of 1500 feet.

The next morning found them over the open sea, a few miles off Cape Orange near Brazil and French Guiana, one hour ahead of their scheduled starting time.

● The *Astraea* had gone down to the water's surface. The waves were gently rocking the ship. All exits and the tower were open, the men were once more pumping their lungs full of exhilarating sea air and looking again at the ocean of this earth which they were soon to leave far behind them.

Taussig was the most excited of the party, incessantly consulting the chronometer. Martin and Meixner stood on the platform, searching the sea with their binoculars.

"That's a steamer, no doubt." Meixner pointed to a tiny curl of smoke in the west.

"I wish that they wouldn't be cruising here just at this time," Martin said grouchily. "She is coming from that direction. I hope that they leave us alone."

"Yes. We daren't be late on a date with Lady Venus."

The craft was approaching at full speed and soon was seen at her full size. Meixner continued observing it while Martin went to get the signal code book.

"They have raised the British flag and are sending out signals," Meixner reported.

"They want us to identify ourselves," Martin had interpreted the signals. "If we don't comply within five minutes, they will fire."

"By what right? We are in Brazilian waters."

Lindner came rushing up to the platform. "Close the exits. Close the exits. We are ready to start. It is high time."

The tower and exits were carefully closed. Everybody went to the central cabin where Taussig sat at the controls, the chronometer in his hand. After a glance at this instrument, "Everything in readiness above?"

"All ready!"

With a jolt, the *Astraea* shot skyward. Below it and almost brushing it, a shell hit the water.

"A last greeting from the present lords of the earth," remarked Martin whimsically.

The earth sank deeper and deeper. Soon they had passed the outlying atmosphere, and the outside aneroid registered zero. The view of the earth widened rapidly. Its spherical shape was now quite strikingly evident.

"We'll soon see all of America," Meixner pointed out. "How beautiful."

"So far the journey is just great. We will soon pass the point from which there is no returning."

"Are you anxious to go back?" quizzed Taussig. "You are right—you still can, you know. We are scarcely more than 3,000 kilometers above sea level."

"Where does the solar attraction become stronger than that of the earth?"

"At about 260,000 kilometers from the earth."

"Tell me," begged Lindner, "could we possibly get to another solar system in a ship like ours?"

"Theoretically, yes. But it would be extremely difficult if not impossible. Aside from the fact that the proper flying direction could scarcely be computed in advance to hit a certain fixed star, there is the element of time—or distance, rather. With the unaided eye, you can see stars which are thousands of light years distant from us."

"What is a light year?"

"The distance that light can travel in one year. Now figure for yourself the enormous distance between us and the nearest fixed star which is four light years away."*

"I wouldn't torture my brains." Martin joined them. "But what would be our top speed in a direction away from the sun?"

"In the outskirts of our solar system, in the orbit of Neptune, we might get up as high as 350 kilometers per second."

"One thousandth of the light's speed, approximately. That would mean 4,000 years to the nearest fixed star. With a fully equipped *Astraea*, many thousand times the size of ours, there would be a chance for the 130th generation to reach their destination. An encouraging prospect."

Taussig laughed. The trio continued their discussion until Meixner finally stopped them.

"Quit it, you fellows. Look back on what we are leaving. But don't speak. It would seem a desecration of such a moment."

All fell to silence and absorbed the strange and mystic sight below them. Almost the entire Western Hemisphere had come into sight. Not unlike the spinal cord of the skeleton of a huge vertebrate, the snow-capped peaks of the Rockies and the Andes topped the even-colored, surrounding earth. Outside of the Great Lakes, the gulfs and islands, no details could be discerned.

None of them tired of the sight below. The continent, the wide glistening ocean, the white, icy caps of the polar regions, and here and there a darker spot indicating the centers of human activity and civilization.

Lindner gave vent to an ecstatic ejaculation, pointing down to the earth with his outstretched arm. The *Astraea* had gotten so far away from our planet, that it now appeared to be a perfect globe suspended in space. Stars were twinkling all around it. A creepy feeling came over the whole party. Despite all their education in science and their logical minds, they had always subconsciously regarded the earth as the center of universal existence, as one absolute fundament. Now that the changed aspect of the earth had made them so conscious of the insignificant position in the cosmos of things, they experienced a feeling of being forsaken, of some integral part of them having been taken away.

"I don't know," Lindner broke the silence, "but I feel sad. Sad, like I felt when I left Europe, only much more poignantly so."

"Yes," sighed Meixner, "there goes our beautiful earth. Probably we shall never see her again."

Martin was staring vacantly ahead in a sombre mood. Taussig was busy at the telescope and altimeter.

"In one hour," he declared, "we shall be going at a speed to take us out of the terrestrial field of attraction. Who wants to go back? It is high time to decide."

*24,000,000,000,000 miles or 8,000 times the distance from earth to Pluto.

"Stop your talk about going back," commanded Meixner. Lindner and Martin, as one man, vowed, "We'll stay."

CHAPTER XIV

In Space

● The *Astraea* was still rising at fabulous speed, although her motion was scarcely evident, except that the field of vacuous space about the earth slowly gained in size. Also, the west coast of Africa, which they had seen before, had disappeared and snowy Alaska was now occupying the western border of the earth's face. The axial rotation of the earth could be observed very plainly.

Taussig looked up. "Attention, we are passing it now. Lindner, give me that rope."

Lindner rose from his seat and the next instant found himself at the ceiling, against which he bumped his head. From there he rebounded back, touching the floor with his feet. Then he was hurled into the gun chamber, where he frantically grabbed hold of a part of the gun.

"I swear," he shouted, "I don't dare take another step. I am dizzy, too."

Taussig sprang to his feet, his hands clutching the sides of the chair. He executed several somersaults with the chair, until he finally landed flat on his back on the floor window. Martin bent down to assist him to rise, fell out of his chair, and started rolling toward the right while Taussig's body moved to the left. They were deflected from the walls, and floated into collisions with each other. The two bodies hit each other in the middle of the room. They tried to assist each other in getting up, only to become more and more entangled. Lindner looked on, his face wearing a look of extreme bafflement.

After many manipulations, which would have been comical had they not been so difficult and made at the cost of many painful bruises, all of them finally managed to be seated again in comparative safety.

Taussig was about to move the black glass over the floor window. Just then, Lindner cast a glance at old Mother Earth.

"Look!" he exclaimed, "what in heaven's name is that?"

They craned their necks to see what was happening.

"The earth seems to be moving."

And indeed, it seemed as if the earth, which had thus far been in the nadir, from the viewpoint of the space travellers, was now rising.

"No," explained Taussig at the controls, "the earth has, of course, still its old orbit. But we have entered the solar gravity field, and therefore the center of gravity of our ship is turning toward the sun, toward which we are falling."

"I don't feel so well," complained Martin. "A mad sort of dizziness has taken hold of me. Everything seems to be whirling about before my eyes. I have a terrific ache in my stomach, yet I have not eaten anything since last night."

"I feel the same way," verified Taussig, and Lindner added, "I am quite done up, myself. Meixner, you are the doctor around here, can't you do something for us?"

"God, I can't even help myself. I can't stand it very much longer," the doctor moaned.

The four men had slipped to the floor. They tried to rise, but their efforts were in vain. They had lost their sense of orientation and the command of their limbs. A violent urge to vomit was battling an overwhelming desire to give in to sleep. Their ears were ringing; everything swam before their eyes until they felt as if they were in the midst of an ocean of flames. Pressure clutched their heads like a vise slowly being tightened. At length they swooned into unconsciousness.

Martin awakened, laved in perspiration. Cautiously he felt his head, looked about him, sat up, and then grew fully conscious of his situation. He was locked in the *Astraea*, racing toward the sun at an infernal speed. But how had it all happened? He remembered that he had felt excruciating pains and had lost consciousness. From there, his memory had been blotted out.

He was sitting in the gun chamber. Light was streaming through the side windows, bathing everything in brightness. Now he began to remember. Somebody had said that he had lost his weight. He tried to stand up. He jumped toward the ceiling; his head touched it lightly, but he landed on his feet and could remain standing. He did have some weight, then. Very little, though, but enough to be able to distinguish up and down, and to be able to move about.

None of his companions was in sight, however. He searched the gun chamber, then the central cabin. Not a living soul. But that was impossible. They must be somewhere in the ship, dead or alive. The ventilators were working, though slowly. All the connecting doors were open. The manometer read 760 m.m., but if one of them had fallen into space through one of the doors, all of them would have been asphyxiated. But he was living and breathing, and his friends must, therefore, be on board.

Through habit, he drew out his watch. It was a chronometer with a ten-day movement. It was running and read 11:30 o'clock.

Martin deliberated.

● He had left the earth in the morning. When he had read the time before it was just 12:45. A few more hours had passed before he had lost consciousness. He must have lain for about six hours. Strange!

Now first of all, he must find his companions. He proceeded warily to the control chamber, where he found Meixner and Lindner, peacefully asleep side by side on the floor and drenched with perspiration. Martin allowed them to lie there for the time being. The next room, the one used as a dog kennel, was locked. No sense in looking there. There was only the platform left. And sure enough, there sat Taussig looking intently through his field glasses.

Noticing Martin, he put down the glasses and said very complacently, "Nothing like a binocular telescope for looking at her."

"At what?"

"The earth, of course."

"That star up there is the earth?"

"Certainly."

A bright star, the size of a fist, which Martin did not remember ever seeing before, was shining in the zenith. It was brighter than the other heavenly bodies, and through the telescope one could see the familiar terrestrial surface, with the Eastern Hemisphere entirely distinguishable. Above, and somewhat behind it, there was a small twinkling star which Taussig said was the [redacted]

"We are now looking at the Old World," said Martin. "When we left, we had America below us. I figured right

then. I must have slept six or seven hours."

Taussig roared with laughter. "Six or seven hours, did you say? You've slept for 6½ days. We are more than four million miles away from the earth, and have still another twenty-odd million miles to go to Venus."

"What!" exclaimed Martin incredulously. "Six and a half days? More than twenty million miles to go? How do you know that?"

"Tell me first, though, aren't you hungry?"

"Yes, I think so.—As a matter of fact, I'm starved."

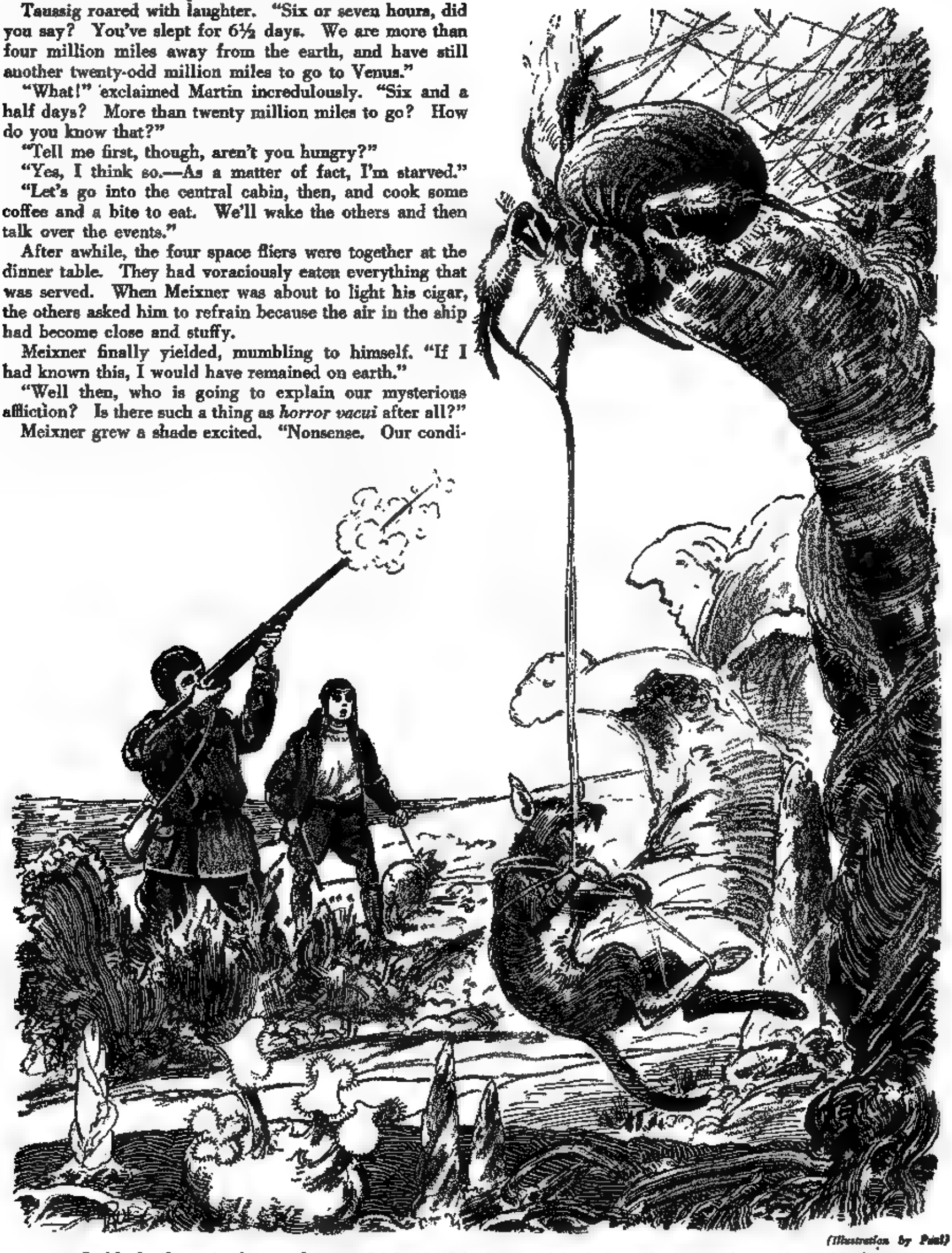
"Let's go into the central cabin, then, and cook some coffee and a bite to eat. We'll wake the others and then talk over the events."

After awhile, the four space fliers were together at the dinner table. They had voraciously eaten everything that was served. When Meixner was about to light his cigar, the others asked him to refrain because the air in the ship had become close and stuffy.

Meixner finally yielded, mumbling to himself. "If I had known this, I would have remained on earth."

"Well then, who is going to explain our mysterious affliction? Is there such a thing as *horror vacui* after all?"

Meixner grew a shade excited. "Nonsense. Our condi-



(Illustration by Paul)

Suddenly the animal vented a painful howl while he was lifted three feet into the air by a black round body.

tion is clinically well known, and I myself am acquainted with it."

Lindner's face expressed sarcasm. "Why can't you help us then? By the way, in what clinic did you study such cases as occur 35,000 miles above sea level?"

"It is the study of ear diseases. In the interior of the ear there are the ends of the nerves of equilibrium, terminating in three curves. They are all at right angles to each other, representing the three dimensions. Every movement of the head works a certain nerve."

"What has that to do with our trouble?"

"Well," continued Meixner, "if the otolithes lose their weight, they cease to exert their normal pressure upon the nerves. Then you no longer have any conception of direction and motion."

"I am beginning to understand now, but what about the dizziness and hum in the ears?"

"Well, dizziness is defined as the incapability or orientating. And if you add the disturbance in the circulation, brought about by the absence of gravity, then you have the whole trouble right in a nutshell."

"Also the fact that we are four million miles closer to the sun than any other human being ever was," interrupted Taussig.

"How can you tell that?" Lindner was absorbed with interest.

"This standard weight attached to an accurate spring scale. It weighs 9,800 grams on the equator of the earth, 7½ grams at the distance of Venus from the sun, and so on."

"For heaven's sake, don't figure out the distance now. We'll take your word for it," Lindner begged.

The meal was finished. The space travellers decided that two of them should keep watch for six hours, each trick alternating with the other two. But already on the second day of this arrangement, they had to change to shifts of three hours. They were all feeling badly and depressed. The ever-increasing heat made breathing difficult and paralyzed almost all their activities. During their spare hours, they sought the comparative coolness of the platform, which was, unlike the bottom part of the ship, not exposed to the direct rays of the sun. While they were on duty, they did everything in a mechanical sort of way, as if they were in a daze. They had no adaptability and presence of mind left to meet possible dangers. Fortunately, nothing occurred to menace their lives.

● Time seemed to stand still, for there was no periodical change of conditions by which to measure it.

Every morning Taussig would announce the correct time, also the distance from their destination. He was the keeper of the records. He alone knew how long they had been on their way; to the others it was an eternity. They hardly remembered ever having led an ordinary human existence, one with human thoughts, feelings, hopes, passions, and disillusions. Everything had been blotted out of their benumbed minds.

On each succeeding shift, they felt a bit weaker.

When one day, after weeks of travel (it seemed like centuries to them), Taussig informed them that he was going to overstay his watch because they would soon enter the borderline of Venus' shadow. His companions received this statement with utter indifference. The three went on the platform, staring at the earth moodily while Taussig remained in the control room.

In about an hour, a rapid change seemed to come over all of them. It was as if the strange planet were extending a hand, protecting them from the destructive beams of the sun. They gradually regained some of their mental alertness and physical stamina. Once more they were thinking, self-confident human beings, up to the tasks that were challenging their daring and courage. They remembered Taussig's last remark and had just awakened to its full import. They rose and went down to see him.

"Where are we?" questioned Lindner.

"Near Venus. We are just entering her shadow."

"That means that the sun's heat must have decreased."

"Yes. Just take a look at the sun."

All jerked their heads down to peer at the sun through the darkened glass window. The sun had lost its circular outline. A considerable segment was cut out of its bright circle.

"Where have I seen something like that before?" Lindner asked himself, aloud. "Of course, it is a solar eclipse."

"Right," agreed Taussig, "except that Venus is causing it instead of the moon."

They all sat in silence, watching the sun diminish little by little.

Unlike an eclipse on earth, it took several hours for Venus to cover half of the sun, which appeared there to be about twice the size seen from the earth.

"How far are we from Venus now?" Martin queried.

"About 160,000 kilometers, I think. Half the moon's distance from the earth."

"Have we already entered the gravity field of Venus?"

"Yes and no. Theoretically, yes, but Venus' attraction has not much of a showing yet against the sun's."

"How close shall we approach Venus?"

"To about 80,000 kilometers. We'll then be right in her field of attraction and then we will discharge right down to normal weight. We will be like a satellite revolving about Venus. If after an examination of her illuminated side, we decide not to attempt a landing, we'll go around and at a corresponding point on the other side, we'll charge again and fly back to earth in the same length of time that it took for us to get over here."

"You have already explained that to me," reminded Martin. "But I do hope that we'll be able to make a landing. How will you tell whether it's advisable or not?"

"I'll be guided by the presence or absence of water on Venus. I could observe it on earth from a like distance."

The diminished solar radiation was now distinctly felt. Semi-darkness filled the room. Meixner removed the shade from the floor window. A huge dark ball had moved itself across the sun, occupying more than half of the firmament. Only a small rim of the sun was left, and the huge mass of Venus stood out plastically from the background, her sides being partly illuminated by the powerful sun.

"Do you notice how the sun's rays are breaking through even in places apparently completely covered by Venus? That is the refractory effect of Venus' atmosphere. Have you noted the busy noise of the motors and your increase in weight? Venus' gravity is asserting itself. Now listen; the sun is now west of Venus, while we are moving eastward. In two hours and fifteen minutes we'll see the sun rise on Venus."

At this moment, the alarm chronometer began to buzz. Taussig sprang to the control wheel and turned it to dis-

charge.

"We are now beginning our revolution about Venus. It will soon be dark and cold."

The sun really disappeared entirely behind the planet. There was an uncomfortable drop in temperature. They turned on all the lights and heaters and wrapped themselves in heavy furs. Still they could not help shivering.

An hour or more passed. Then a huge pinkish white globe took form far in the east. For a good while, the four friends kept staring at the strange planet until a bright point rose out of the vague aura of mist.

"Hurrah, the sun!" shouted Lindner.

"Ah, so soon!" replied Taussig, looking again at the chronometer. "Why, of course, we see it a little earlier because of Venus' atmosphere. Now that you are frozen stiff, you are glad to see the sun rise again, aren't you? The same sun that you angrily cursed just a few hours ago."

CHAPTER XV

The Landing

● The dark glass shade was again placed over the window, yet a comfortable warmth soon filled the room.

"It will take another hour," Taussig continued, "before the sun has risen high enough so we can make out anything on Venus' surface."

"There is one thing that I would like to know," said Martin. "How is it that we don't see anything of the illuminated side now, and how is it that we will be able to observe it in an hour?"

"How stupid you are!" Taussig teased him. "Can't you see that we have become a satellite of Venus? Our center of gravity, therefore, is no longer pointing toward the sun but toward Venus. That is why the sun appears near the edge of the floor window and no longer in its center. During one circumnavigation, our ship will make one complete revolution about its longitudinal axis. —"

"Yes, I know," interrupted Martin, "but do you think that we'll be able to make as easy a landing as we did on earth when we got rid of the Colonel?"

"By no means," Taussig assured him. "If we decide to attempt a landing, which decision we have to make within the next hour, it will be a very difficult feat."

"Let's have a bite to eat before undertaking it."

Meixner rose and prepared a meal from canned goods. But, despite their appetite, the four men could scarcely eat anything. Taussig, in particular, was excited. First he would move back the darkened glass an inch or two, only to replace it again. Then he would give the physical instruments the once over. Then he would sit down at the control table, remove the black glass shade, put the telescope to his eye and observe intently for some moments what appeared below. At last he rose, and his will power could not conceal the tremor in his voice as he said, "I think we'll land."

The men looked down for minutes. The bright sunshine had made it impossible to see anything with the naked eye.

"What can you see down there?" they asked Taussig.

"Oceans and islands, water and land. Are you all agreed on an attempted landing?"

"Yes."

Taussig turned the wheel to the left and held it there. "Now comes the acid test for our *Astraea*. The upward movement and the fall can easily be directed, but with our enormous speed in the direction of a tangent, I am afraid that the friction with the atmosphere might melt the quartz shell of our ship."

"Can't you arrange that we touch only the uppermost layers and then return into space, repeating that until we've lost most of our speed?"

"That is the only thing that we can do,—by the way, we are falling."

"Oh, Lindner," Taussig continued after a moment, "will you put that aerometer between the inside and outside windows? When we hit the atmosphere, you can let the outside windows down and report to me the movements of the needle."

They were still falling rapidly. The altimeter indicated that. They also felt their body weight increasing, and noted that the surface of the planet was speedily coming closer. The glare was still too strong to make out any details with the naked eye.

Taussig turned the wheel again, this time to the extreme right. They still kept falling. A strong feeling of fatigue overcame them. Their limbs began to ache and their eyelids felt as if they were lead. But the wild excitement of it all kept them awake.

"Meixner," said Taussig, throwing the wheel back to its old position, "give me a camphor injection, a heavy dose of it, for I fear I may go to sleep here at the wheel."

Meixner complied with his request.

"Ah, that feels good. Why don't you administer it to the rest too? We'll need all our energy today."

They were still falling from the unheard of altitude of 80,000 kilometers. Taussig was all attention at the controls. Nobody had spoken for quite a time.

Suddenly the four made a sound of enthusiasm and joy. Below, there was an ocean, a strange, immense sea. There were distinct insular formations, and toward the dark side apparently a continent. The myriad bays and peninsulas on its coast line reminded one of Greece. Meixner took out the kodak to immortalize the first impression of a new world. The surface was now rapidly moving toward them, but only a part of Venus' hemisphere had remained visible.

"Listen, Meixner," ordered Taussig, "go over to that Venus altimeter and tell me whether we are falling or rising."

"Falling now," Meixner reported, handing the kodak to Martin. "The needle is pointing exactly to 1,000 kilometers from the surface now."

"1,000.60,—that means that we are rising?"

"Yes. I am testing the controls; will you continue reporting the changes?"

"999.1."

● In monotones, Meixner reported a gradual drop down to 60 kilometers. Then Lindner opened an outside window and observed the aerometer carefully. It indicated no pressure.

Within another hour the *Astraea's* altitude was cautiously lowered to kilometer 40. Then Lindner reported 10 m.m. of mercury. Shortly thereafter there was a faint whizzing sound.

The men looked down to the planet below. They grew fully aware of the enormous speed at which their craft was racing above Venus' surface. All the visible portion of it was bathed in bright sunlight. While on one side, near insular formations, there came within sight, island

after island, on the other side another group of islands sunk, one by one, below the horizon. The whizzing sound had become almost inaudible.

"Our speed must have decreased somewhat," commented Taussig. "I think that we can venture a little deeper."

After a little while Taussig swung the wheel back again into the right position. "Unfortunately, we must go up again. See that huge mountain ahead of us. Notice the peaks without any snow, while the lower regions are white with it. This planet has something on ours so far as high mountains go."

Behind the mountain chain lay land, broken by gradually deepening terraces. They had passed the snow covered mountains. Then dark green hills struck their eyes until they finally found themselves above an apparently fertile plain, with glistening spots here and there like bodies of water.

"At night, this circumnavigation would have been fatal. Most likely we would have crashed into one of those high peaks at a speed of 20 kilometers a second. Where and when are we going to land now?"

"Either in Koenigsburg or in Costock," said Taussig dryly, "if we don't get rid of this cosmic speed of ours. Until we regain full control of our ship, we can't dream of landing. We didn't travel through space for 35 million miles only to have this ship crash to pieces during the last six or seven miles."

The ship descended a little deeper into the atmosphere and the whizzing sound again increased in its intensity. It decreased, however, as the speed of the vehicle was partially slackened. This play repeated itself eight times until Lindner reported an outside pressure of 300 m.m.

Meanwhile, the sun had passed the zenith and dropped a distance toward the horizon.

"Let's see whether she will obey the rudders," Taussig suggested.

This attempt proved utterly impossible, and the terrific wind resistance threatened to snap off the rudder.

Taussig coaxed the craft down lower.

"400 m.m. outside pressure."

"Here in this thicker layer, the speed ought to brake more readily," Taussig informed them. "If only I could turn the ship around and make use of the propeller."

"Why don't you set the motor in reverse?" Martin suggested. "It's easy enough."

"That's an idea," acknowledged the commander, "Why haven't I thought of that before?"

The craft's speed decreased now with great rapidity. She was drawing closer every minute to the surface and details of the planet were growing sharper momentarily. Enormous forests, groups of yellowish earth hills, sparkling water surfaces, lakes, rivers, and ponds.

The sun was almost touching the horizon when Taussig announced that the *Astraea* was now under control, and that he was prepared to attempt a landing. He had already decided upon a suitable spot.

"Open the windows now and let's have some air," ordered Martin.

Soft, warm, fragrant air soon filled the ship. The men took deep breaths; what a relief after days of regenerated air!

Meanwhile Taussig had turned the ship, raised its nose and was heading it back for a high hill which they had just passed. On flying over it again, they noticed a pond on the plateau about 200 paces around. Apparently it was fairly deep for its bottom was invisible.

Slowly the *Astraea* descended to the surface of the pond at the same moment that the sun struck the horizon.

Taussig rose from the controls, stretching his limbs. "Here we are," taking a deep breath, "Meixner, let me have a look at the champagne."

"I don't know," said Martin, "but I am not exactly in a festive mood."

Meixner smiled. "You'll get over that all right. We are all very tired from our strenuous journey. Am I glad it is over?"

Lindner looked at the barometer. "630 m.m. of mercury. Almost similar to terrestrial conditions, allowing for the lesser gravity. We'll be able to breathe without much trouble all right. But champagne? Not I. I have only one desire now,—sleep, and plenty of it."

"The same with me," Taussig chimed in. "Let's close the windows."

"What for?" Martin protested. "The air is mild and warm."

"What about the insects?"

"Ridiculous, with our heavy screens which we can electrify. Let them come, the Venusian creatures."

The sun was sinking. With very little twilight, the whole scene fell into darkness. The first star began to twinkle in the firmament. But not even Taussig felt induced to pay any attention to this novel nocturnal sky. Exhausted and fatigued, they all sought their bunks and soon were soundly sleeping.

● Lindner awoke first. Thoroughly rested, he felt in an excellent humor. His attention was arrested when he cast a glance outside the window.

The ship was wrapped in a whitish coat of bright mist, which made visibility impossible at even the shortest distance.

Lindner was greatly puzzled as to the nature of this phenomenon. The mist was waving to and fro like a cloud. Was, perhaps, the Venusian atmosphere luminous and opaque?

But no, only yesterday had they not distinguished oceans and islands, mountains and forests?

When Lindner entered the control chamber, he found his friends just getting up. Martin and Taussig, lying on their stomachs, were observing the marine fauna through the plate glass floor window.

The limited field of vision was alive with a multitude of aquatic animals of countless kinds. There were eel-like creatures without fins, but equipped with hundreds of flagellums and threads; sphere-shaped animals, naked and sleek as snakes, with two or three tentacles which served for locomotion. There were also multifarious species of crustacea of all sizes.

"You are right," Martin continued a previously begun conversation, "I have not seen anything fish-like myself, yet."

Lindner addressed him, "So you are staring in the water at crabs or whatever they may be, instead of out of the window to behold something far more interesting."

"See what?" asked Taussig, "You can't see anything for all the fog."

"So that is what you think it is? The funniest fog I ever saw, I must say."

Meixner smiled in amusement. "I have already caught this mysterious fog. There in the epouvrettes."

He pointed to a number of plugged epouvrettes containing a reddish-gray, translucent fluid.

"What is that?" inquired Lindner.

"Media for bacteria. Ordinary broth in one, blood serum in the other, and concentrated broth from Venusian mollusks which I caught this morning with an angle."

"How long are we going to stay here?"

"Not very long, I reckon," answered Taussig. "We'll have our breakfast here. If, by then, this fog which the doctor thinks is of bacterial nature, has dispersed, we'll go out on a little scouting tour, otherwise we'll stay somewhere close by where there is no fog."

The four men carried their frugal breakfast to the platform. A warm fog still enveloped the lake and the ground. Here and there, however, small clearances could be perceived, not large enough to see through, but indicating that the fog was thinning away.

"Nasty thing, this fog," grumbled Lindner. "I wish it would clear up."

It was as if the evil air spirits of Venus were just awaiting this password. Lindner had scarcely finished his remark when a gentle breeze arose. The fog was dispersed in every direction. A large cloud of it was blown down upon the water, to which it gave a silvery, downy blanket. Another cloud of it coated the vegetation. The remainder was blown away. There was now open vision.

The lake was bordered on three sides by green bushes. At a distance, they gave the impression of terrestrial vegetation, but appeared quite differently upon close observation. They were a wild jumble of leaves of every color and shade, so closely interlocked as to look like a huge natural carpet. It reached the height of a man in some places. Superimposed upon this formation, there were, what appeared much like earthly trees, huge plants with a green bark and no branches. They measured ten or more yards in diameter, towering a hundred yards high and then spreading into thick foliage.

The soft breeze had died. An almost sacred silence reigned for awhile. The air was sultry as on hot days on earth, and the surface of the lake mirrored the clear blue sky.

Then there was a crackling sound in the thicket. As if by force, four pairs of eyes turned in the direction of the sound. All were curious to learn its cause.

After a moment, something cylindrically shaped and black emerged from the conglomerate of green.

"Ah, a foot," spoke Taussig, "with a hoof like a horse's."

Then another foot followed, a third and a fourth, and then a huge black trunk came into sight, twice the size of a man. There were also two other extremities similar to the shears of a crab. The animal lowered its trunk into the water, sucking in the water quite loudly. Then it raised its trunk, stepping into the water with its two forelegs. Now it was presented in its full hugeness. It was about twenty-five feet long, ten feet high, considerably larger than the elephant, had three pairs of legs, a pair of shears and a trunk.

CHAPTER XVI

Danger!

● It proceeded to do a little fishing, picking one shell animal after the other from the pond, crushing them with a terrific noise. Then the trunk would descend and devour the broken mass. Suddenly the giant halted in apprehension, waving its trunk toward the ship as a sniffing dog would do.

Martin was feverish with a desire to shout.

"Fellows," he roared, "I'll take this beast's measure."

Saying this, he aimed his Mauser gun and shot at the hulking mass.

The feeble report gone, they heard a hoarse groaning sound as answer and saw the whole black mass of the monster plunge headlong into the water, making for the ship.

Four guns were instantly directed at the beast and a shower of bullets rained upon him. Two yards from the vessel, the monster turned over, showing its whitish belly. The eight extremities jerked in paroxysms of pain which finally subsided and then ceased.

Martin picked up from the floor a rope as thick as a finger, made a sling in it, and threw the improvised lasso about one of the legs of the monster. Joining forces, they drew him up beside the ship.

"What now?"

"Well," explained Martin, "the doctor ought to dissect him so that we can learn whether his meat is edible or not."

Taussig shook his head incredulously. "How is he going to settle the question?"

"That is what I took the hogs along for."

"Why the hogs?"

"They have an extremely fine sense of taste and smell. Anything that a pig will eat is fit for human food."

Meanwhile Meixner had climbed down to the animal on a rope ladder, cut off one of the legs with a set of bowie knives, and fastened it to the rope. The four men pulled it up on board.

It was an animal with three-jointed extremities. A round, thick, upper thigh was on an equally long, but somewhat thinner lower thigh. Then the foot with a horse-like hoof, covered with a projecting sharp claw. The skin was sleek and shiny, hairless and hornlike in texture. It could be cut with the heavy American knife. They dissected the leg, saw the nerves, blood vessels, and muscular structure, but to their surprise there was no bone.

"This huge animal is an invertebrate," decided Meixner, breathless in astonishment, "instead of a skeleton, it has a hard shell like our crustacea. Let's cut off a piece of the flesh, now, and see whether it is edible."

"I'll go on a little scouting trip, meanwhile, and take a look at the countryside," said Martin.

"So will I," said the other two simultaneously.

"We can't do that," objected Meixner. "Let only two of you go, and the other stay to prepare the lunch. Toss a coin, boys."

Martin and Taussig were to be excused.

"I'll take you on shore on the *Astraea* and then go back into the middle of the lake," suggested Lindner.

"I'd like to take a dog and one of the hogs along," insisted Martin.

The little expedition looked decidedly comical. Ahead of them was a big German police dog, evidently enjoying his long missed freedom. Behind stalked Martin in a leather trapper's attire, like Taussig, who was dragging behind him a huge hog on a rope.

The vegetation they came upon immediately after leaving the ship was of greatest interest. Everything was so strange, so exotic, never before seen by any man. The green growths on the ground were really three to five feet

long, cylindrically shaped stems, very soft and bulging with sap. The hog seemed to like them very much for she immediately began to eat at them as she trotted along. Martin cut off a specimen of this plant to take back with him to the ship.

Now they inspected the higher plants. The most amazing thing about them was the excessive size of the leaves. Leaves of all shapes; heartlike, lancettes, haired, sleek. But the smallest specimens had an area of at least four square feet and the thickness of a man's fist. The leaves were directly attached to the stems.

"Strange flora, indeed!" mumbled Martin.

"You must remember that these are the tropics even though we are 7,000 feet above sea level."

"But I see no small animals, insects, worms, no fruits or flowers."

"There is a flower for you right there. And a very pretty one too."

● It was a lovely bloom as large as a head of cabbage, set in the center of a leaf forming its base. The leaf was circular, green and at least fifteen feet in circumference. A sweet fragrance was exuded from it, suggestive of roses. The flower was wide open, its center containing a large stamen. It resembled much the terrestrial *centifoliae*.

Martin suddenly grasped Taussig's arm, pointing in the air above him. A bird-like creature was swiftly coming down in narrowing circles. It was smaller than a lark, and its movements were so quick that one could not see just what kind of creature it was. It finally reached the top of the flower and perched itself in the depression of the bloom.

With surprising suddenness, the leaves of the flower folded up over their hapless victim. All the observers saw now was a reddish-purple ball larger than a man's head.

Puzzled, the men looked at each other. "Ah, a carnivorous plant," exclaimed Taussig. "I must take that along to the *Astraea*."

He approached the flower, then halted in amazement. The supposed flower made half a rotation, a tube-like organ shot out from an orifice, ejecting a strong-smelling fluid. Then the ball detached itself from its leafy base and began rolling down the slope, soon disappearing.

The two men were just about to discuss this strange phenomenon. They were walking up the slope which led to the plateau when suddenly, Bello, the dog, tore away from them and excitedly ran, with the hog also following suit as fast as her plump legs would permit her to go.

The explorers were soon to see the cause of all this sudden commotion. A serpent-like beast, twenty feet long, as thick as a man's thigh, was making its way quickly toward the party, hissing as it came nearer. Taussig's first thought was his gun, but the long mountaineer's cane impeded him. So, at random, he hurled the cane at the creature. Luckily enough, the spear pierced the serpent through its middle, pinning it to the ground. It curled up in agony, its lower side turned up and was equipped with many short legs. About a dozen shots from their automatics were required to kill the animal.

"Ye gods," swore Taussig, "it sure does take a lot to blow the daylights out of this ugly looking thing. Do you know what it is? Looks like a centipede raised to the *nth* power.

"If this is the size of the Venusian centipedes, what must the crocodiles and sharks, and even the human beings look like?"

"You must not forget that we are in the tropical zone of a planet that receives twice as much light and solar heat as the earth."

"Don't I feel it?" replied Martin, wiping his forehead. "But here we come across our two runaways,—here, Bello. Our cute little pig is eating again. I wonder what she has found now?"

The dog approached and sniffed at the dead worm with evident displeasure. The hog had dug into the ground and unearthed several blue root bulbs, the size of a child's head, one of which she was devouring with evident relish. The friends gathered two of these bulbs and proceeded up the stony path.

"What do you think this is?" asked Taussig, taking up a handful of brilliant stones. They ranged in size from a cherry pit to the size of a walnut.

"I don't know exactly," replied Martin. "they may be rock crystal."

"Rock crystals don't come in octaeders," mused Taussig, "I think they are diamonds."

Martin now inspected one of the stones carefully. "Might well be. But look at all the thousands of them. If they are diamonds, they are worth countless millions."

A monstrous winged creature, with a body the size of the human adult's and a wing spread of twenty-five feet, suddenly soared from a group of trees which they had been approaching during their conversation. The huge bird, if it could be called a bird, circled over them about fifty feet from the ground, and then suddenly dropped a fist-sized stone which barely missed hitting Martin. Both he and Taussig jerked their guns to their shoulders, aimed and fired. The winged creature began to sway, but managed to escape beyond a hill where it apparently went down.

"One sure does have to have good nerves on this planet of yours," said Martin.

They had reached the border of the group of trees. Besides the kind of green plants with which they were already familiar, they saw a number of strange red and yellow fruits, and also many flowers of various size and formation.

"I am not going into this jungle," Taussig declared. "I don't feel any too comfortable. Let's report our observations to the others and then decide on further activities."

"Don't back down so quickly. We ought to inspect the territory as far as it is accessible. I can hear a rustling sound over there to the left."

They followed up the sound. A spring leaped from between two rocks. It flowed briskly over a distance of a hundred feet, over cascades and miniature waterfalls, losing itself in a thick carpet of plants

● Two animals drank the water thirstily. Taussig and Martin tested the water carefully, and finding it pleasant and cool, they did not hesitate to quench their own thirst with it. They followed the spring along its course, when suddenly the dog showed signs of alarm, sniffing excitedly all the while.

They had reached an area of somewhat denser vegetation, although the "grass" was not very high. Before them were two trees about 120 to 150 feet high, standing

thirty feet apart. They were aware of some stealthy movement between the trees, but could not detect the nature of it at the moment. Both got their guns ready, Taussig loading his gun with an explosive-containing bullet, very similar in its miniature size to a shrapnel shell. Warily they followed the dog.

Suddenly the animal vented a painful howl while he was lifted three feet into the air by some invisible force, so it seemed. Then a black, round body could be seen, suspended from the tree. It was three feet in diameter, and working frantically with two of its tentacles, it drew the dog upward inch by inch

'Well, I'll be——. A giant spider" shouted Martin.

A report from Taussig's gun, and then another from within the black mass of the writhing animal. It burst into pieces, some of which fell to the ground while others remained in the tree in convulsive movement. The dog, too, fell to the ground and made for his masters with a deep howl. His right foreleg was clutched in a sling of a string-thick, transparent thread of some sticky and extraordinarily tough substance. With no little difficulty, Martin freed the dog from it. Then the two decided to call it a day, wending their way thereupon to the lake.

Meixner who had seen them coming, was just lowering the *Astraea* on shore when they reached the waterfront.

He welcomed them in good humor. "What are the vegetables you've got with you? Let's see whether we can make use of them in the kitchen?"

He took one of the green stalks and cut it into five pieces. He smelled and tasted one of them, then put each of the pieces into separate dishes and set them on the electric plate. "We'll have lunch in an hour," Meixner returned to a subject of more importance. "The soup is on the fire, also some meat which we killed this morning. Green vegetables which we got from the lake, too."

"How did you kill the time?" Martin asked.

"Oh, I made up a few sections of the animal we killed. It's a kind of a cross between a spider, a crab and an insect. Low form of animal life, anyway. Then we scouted around on the water a little with the *Astraea*. I saw a group of thin, pointed plant stalks sticking out from the water near the shore. Doesn't the smell remind you of some kind of condiment? Since the hog had no objection to them, I don't believe that they are harmful. We then hoisted the remainder of the beast's corpse from the water and dropped it some distance away on land. We noticed a number of animals looking like giant ants. They were standing on four hind legs and busying four other members with a colossal tree trunk. When we dropped the cadaver, they fled. We landed and took a sample from the pith of the trunk. The whole thing looked like a huge mushroom without the cap. The pith reminded me of sago but is of finer grain. And what have you in your specimen box?"

"Just a little something for Mrs. Lindner," Taussig answered casually. He handed Lindner the stones.

Lindner examined them thoroughly. "Well, I'll eat my hat if those aren't diamonds of the very finest kind," he exclaimed ecstatically. "This represents an enormous fortune that you have given me."

"Over there behind the thicket you'll find them by the thousands. We'll go there before we leave and pick up a few millions' worth."

"We also heard your guns bark several times," stated Meixner.

Martin gave a detailed report of their expedition. The longer he spoke, the more serious grew Lindner. Meixner's attention was divided between his specimen dishes and Martin's report. When the latter had finished, he said, "Well, we have another half hour until lunch. Go up to the platform and,———What the devil is this?"

The ship began rocking violently. "Taussig,—Taussig!" shouted the chef frenziedly, "get a move on and take the *Astraea* up a thousand feet or so,—I can't cook anything this way!"

Taussig complied forthwith. The air was perfectly calm. The lake, however, had all of a sudden begun to rage and throw up vicious waves.

The *Astraea* rose and slowly drifted toward a small woodland area crowning the hill. From this point they had an impressive bird's eye view of the whole territory. The tiny, gleaming mountain lake, now calming as abruptly as it had begun to boil, the bushes bordering the lake and beyond, the stormy plateau from which the diamonds glistened. They descended into the crown of one of the huge, tree-like plants on top of the hill, full of giant, golden fruits of some kind. Martin and Lindner, well armed, went to the platform to pick one of them.

Then in another instant, the sound of two shots, and at the same time Martin's command, "Up, right away!" Taussig threw the wheel into the extreme right position and the *Astraea* rose obediently.

After a short interval, "Stop!" barked Martin.

CHAPTER XVII

Attack from the Air

● Meixner rushed to the platform to learn the cause of their quick move. Coming back, he reported to Taussig, "It's nothing. They shot an animal which made for them with a heavy branch from the tree. They were trying to pluck two of those big apple-like fruits. The cadaver of the queer beast is on the platform. Looks like a winged ant the size of a man.

"Not the fragile ones of our ants though, but with regular feathers. It also has a trunk like the animal we killed this morning, and four pairs of extremities, one of which was like a crab's shears, while the others tapered into hands much like a human being's. Each finger bears a keen claw. Recalling this morning's hunt, I took a good look at the inside of that animal we killed. I found a stomach, intestines, a liver and several glands which I thought were spleen, kidneys, and perhaps hermaphroditic reproductive glands, also the main strands of the nerves, the gills and lungs. When I attended medical college, I had to dissect all kinds of animals, but never have I encountered such a jumble of organs."

"Very interesting," commented Taussig, "but how about going back down the lake? It is quite calm now."

Meixner, again giving his attention to the cooking, nodded affirmatively. The *Astraea* descended easily onto the mirror of the lake. Lindner and Martin entered the central cabin.

Meixner opened a small folding table. "Where are the apples?" he asked.

"After dinner. We'll have to see first whether the pigs like them."

Martin brought out a bottle of Rudesheimer wine. "From my secret cabinet," he smiled. "The first dinner prepared here on what Venus can offer shall be washed

down with a glass of old Rhine wine in the absence of a fitting domestic product. The first sip is to the Goddess whose name our planet bears. Here is to what we love!"

His companions responded with gusto to his toast. Meixner brought the steaming soup.

"Let's say grace," he soberly suggested.

The first course was eaten in silence. Then came a roast with vegetables.

"The roast reminds me of capon, except that it is juicier," observed Martin. "And the vegetables taste like mashed potatoes with truffles."

"They are the bulbs that the hog dug out of the ground this morning. Now, take a look—here is a delicacy—."

It was a course of tender, pink, sliced meat which, apart from a faint earthy taste, tasted much like fish. There was also a salad of green leaves with a sour dressing. It tasted like a mixture of lemon, orange, and pineapple.

"From what is this made?" inquired Taussig.

"It is simply boiled meat from a small crab. The salad is made from the leaves you brought home. Here is a cake baked from the flour-like stuff from the tree trunk, and lard from the animal we killed this morning."

"Everything is delectable," praised Lindner. "And this is our dessert?"

A slice of the fruit that was picked to the great consternation of the giant ant was placed before each of them. Within a stony shell, which had to be sawed through, they found juicy, reddish yellow fruit meat with a slightly tart, aromatic taste. Very delicious, indeed. The diners admired not only its pleasant taste but marveled also at its great size, at least thirty inches across.

The dinner was concluded with demi-tasses. Martin brought in some cigars and all indulged in a long denied pleasure.

"Sure does smell great," approved Meixner. "I think that the next thing to do is to go out to the rocky plateau and gather in as many diamonds as we wish to take along with us."

"Fine idea," agreed Lindner, "we'll have good use for a little money when we get back to earth."

"All right, then," put in Taussig, "let's go up and land near the plateau. Two of us will remain on board while the others go out looking for the gems."

"I'll go with Lindner," proposed Meixner. Each of us will take a knapsack and pick out the biggest stones."

"And remember," admonished Martin, "that one shot is the signal for immediate return. Leave everything in such an event and rush on board."

The two treasure seekers had been out for half an hour, when Taussig, standing beside Martin on the platform, drew the latter's attention to what seemed a little gray cloud rising over the northern horizon. Martin studied the phenomenon through his binoculars, then fired a shot.

After scarcely a minute, Meixner and Lindner returned on board, their bags almost filled. Within the same short time, the little "cloud" had grown to be a big black one. It loomed now over their heads. Other similar clouds were advancing from all directions.

Taussig leaped to the wheel and threw it down hard.

"This 'cloud' consists of swarms of Venus' highest beings, the lords of this world of whom we killed two this morning," he revealed to the others. "If we gain a greater altitude before they close in on us, we'll lick them. Otherwise we are in for a tough time. Let's hope we can sneak through them. Keep the gun holes open—There you are."

It had grown dark quickly. The animals that had concentrated above them from all points had formed an impenetrable blanket, so it seemed. "Now we'll have a showdown," said Martin grimly, switching the motor to its full power. "We'll try to break through. Watch out, we are going to hit them now."

● The impact was terrific. The vessel trembled. Lamps and floodlights snapped into darkness. The *Astraea* was zooming through the air with mad speed, but it was impossible to break the cordon of its opponents.

They were right in the thick of the fray now.

They could see the Venus people very clearly now. They were man-sized beings with eight extremities. Some of them had wings with a spread of twenty-five feet, others were wingless and riding upon creatures of a different specie which were considerably bigger and also octuples. They were almost indistinguishable to the travelers, and on the other hand, they were all too excited for cold-blooded observation.

With the first group, a human expression was unmistakable on their faces, although the long trunk, replacing nose and mouth, was very distorting and lent a comical appearance to their faces. But the lively eyes, the high forehead and the oval cranial structure pointed toward considerable intelligence. Only Martin and Taussig were noting these things; Meixner and Linder crouched behind their machine guns, gloating over their rattling and death-dealing sounds.

Martin glanced through the periscope. Not a chance to get through. There were six or eight more layers above. "Let's turn on all guns," he bellowed into Taussig's ear.

The ensuing fusillade was deafening.

Taussig shook his head as he noted the futility of the barrage.

"Switch on all the varium tubes," he yelled back.

No sooner said than done.

In another half minute the *Astraea* had to fight her way through the mass of animals. Stunned bodies collided violently with the shell. Dozens of them. But soon the vessel had emerged above them and made a leap upward. Below them, the clearance that their varium tubes effected for them, closed again. Silence again reigned in the *Astraea*.

For miles they saw the living, quivering mass. There must have been hundreds of thousands of them.

"I certainly must give them credit for having a well organized state," Taussig said. "I'd like to see any European state duplicate their mobilization of such an army within such a short time."

"Yes," agreed Martin, "except for our varium tubes, we would have been in an awful predicament, in spite of our machine guns and superior human intelligence. They certainly have a lot on us. I don't believe that there are any vertebrates here on this planet."

"Probably not," ventured Dr. Meixner, "because the animals that are highest up in the scale of evolution are usually dominant in power among the rest of them. By their unusual intelligence and their actions, also by the fact that they have put other creatures to work for themselves, prove that these animals are the true rulers of Venus. A more highly organized animal can, therefore, not exist here."

(Illustration by Paul)

They could see the attacking cloud of Venus people clearly. They were manized beings with a human expression unmistakable on their faces.

"Necessarily not." argued Martin. "Organized community life is found among quite a few lower forms of terrestrial life. The ants for instance, they even keep domestic animals. Those earthly insects react similarly to a disturbance such as we caused here, but the Venus beings are only larger and stronger, owing to more favorable conditions, richer solar radiation, for example."

"We don't even know," joined in Lindner, "but that conditions on earth might have been similar to these millions of years ago. I can easily imagine that things were like this at a time when the earth's crust was softer and warmer, the atmospheric humidity higher, and the solar radiation stronger. Our insects are bigger in the tropics, for instance, than in other regions."

"You mean, then," asked Taussig, "that our present ant and bee states are the degenerated remains of once mighty and great nations that dominated the earth? The temperature went down and diminished the number of those air creatures, at the same time giving rise to an era of vertebrates which left the water, up to that time their habitat, adjusted themselves to conditions on land and finally gained superiority. This is supported by the enormous size of fossilized vertebrates, from which the smaller ones evolved that now rule the earth. Their decrease in size was an evolutionary adjustment to a drop in temperature extending over millions of years. Here on Venus, we still have pre-Cambrian conditions. Even in the deepest earth layers explored, we have found no traces of that period."

"What is pre-Cambrian, may I ask?" Martin was interested.

"Just as a tree has rings indicating various periods of its life," Taussig began explaining. "The organic life on earth during the various eras has left traces in the crust. Hundreds of such distinct layers can be identified on earth. The lowest is the Cambrian, below which there is humus. Since humus represents a testimony to former organic life, it is evident that there must have been animal or plant life, or both, on the earth prior to this period."

● "Fine," said Meixner, "but let your lecture end now. It is almost dark and we have not selected our quarters for the night yet. Friend Taussig is sitting at the controls philosophizing about a thousand and one things instead of doing his duty."

"Right you are, old boy," agreed Martin. "Well, we are awaiting instructions, Mr. Astronomer."

Taussig grinned. "Easier said than done. Please close all the windows and exits. We'll go up into space and then down upon the ocean. Here there is only jungle as far as the eye can see. After our experiences of this morning, I should prefer a different place to spend tonight."

They passed the atmosphere in a rapid ascent. Looking down, they saw Venus as part of a huge sphere. On its surface, in raised relief, a great island which was separated from the ocean by a high mountain chain in the west. In all other directions, the land lowered gradually toward the sea. Taussig inspected the territory carefully and then turned the wheel to the left.

"When we get back into the atmosphere, we'll have to head south for a few miles. I think we will reach the open sea before sundown. Tomorrow I should like to go up one or two Venus radii to make a photographic map of one side of this planet. It will come in handy on future trips. Some other time we can make a map of the other side."

"Future trips? Some other time? Just how long do you mean to stay here?" Lindner wanted to know.

"Well, until the next conjunction with earth," answered Taussig. "Until then I have ample time to determine all the astronomical factors necessary for our return which I do not know yet."

Lindner rose. "Do we have to wait for the next conjunction, or can we go back sooner?"

"We could return within the coming fortnight, that is fourteen terrestrial days. The later we start, the longer we'll take. We can't start yet today, though, because—."

"Because you lack a few data necessary to determine our direction, I know. How long will it take you to find that out?"

"One or two clear nights."

"All right, then. Answer one question for me: What practical purpose has this trip of ours?"

"You know that yourself."

"Well, what might it be?"

"To see whether Venus is habitable for human beings."

"I guess you can settle that too in eight days. Later settlers may make exact maps then. They won't land by the map anyway."

"Lindner is right," said Meixner. "We've already settled the most important question, that Venus is accessible to man. The sooner we return, the better."

"That's my opinion too," said Martin.

"Let's make a program for the next few days, then," suggested Meixner.

Taussig nodded in consent. "We are now in the tropics of Venus. If we venture into the southern region, we are bound to hit places where we feel more comfortable. Even on earth we would be in constant danger in the tropics."

Lindner shook his head. "I doubt if there is such a thing as temperate and arctic zones on Venus. Do you remember, Meixner, our noticing the absence of white polar caps as we were approaching? White snow we would have recognized even at night, just as we did on the earth."

"That's right," Martin recalled eagerly. "It's only on high mountains that we saw snow on this planet. I wonder why."

"The thin, solid crust of Venus has probably not yet cooled off in the same degree into such depths as on earth. There is no snow on the poles because the ground is too warm. For that reason, there are no temperate and cold zones."

Meanwhile they had again reached the atmosphere and the craft obeyed the rudder. Nose downward, the *Astraea* raced southward. After awhile they saw land below them and the ocean south of it. About thirty miles off the continent, Taussig lowered the ship to about sixty feet above sea level.

He searched the water's surface with his telescope. Meixner opened the windows and a fresh sea breeze blew into the room, carrying an indefinite salty tang. Nowhere could cliffs be seen nor the sound of breakers heard. Slowly the *Astraea* descended to the surface of the water.

The barometer registered a pressure of 860 m. m. Martin tried to fathom the depth of the water, but gave up after the line had been lowered to 180. Lindner got a specimen of the ocean water for a chemical analysis. Meixner was busily engaged, cooking.

The sun was sinking. Although twice the size in ap-

pearance as on earth, it went down rapidly below the horizon without a twilight. Five minutes after its upper rim had dipped below the horizon, night fell over everything.

CHAPTER XVIII

New Dangers

● The light of the sun had vanished. But there was no complete darkness. The ocean was luminous. The space travellers had seen "*Meeresleuchten*" (a phenomenon in which the surface of the ocean emanates a faint shimmer) on earth. But this was much more intense. The light penetrating from the floor window permitted them to distinguish even the smallest objects in the room.

Now they went up to the platform to take a look at the nocturnal sky. It was not black but efflorescent in an uncertain hue. Vision seemed somehow obstructed, although not the trace of a cloud was visible at sundown.

Meixner had prepared an appetizing supper out of the left-overs from dinner. They sat together, ate and drank mechanically, all in a pensive reverie. When one of them made a remark, the others would listen in silence without taking up a coherent conversation.

The cigars were lighted. Taussig began to attract attention by restlessly pacing the floor. Any question would only elicit an absent-minded, "Hm-m."

"What the devil is the matter with you?" someone finally demanded.

"The trouble is that I can't see the stars," was his reply.

"What of it, haven't you seen enough of them yet?"

"I ought to be able to see them from here. I have a vague idea about our bearing. But I have to know it accurately. The compass points south, just as on earth. But who can tell me how much the magnetic pole deviates from the geographic one? Then also, I don't know the inclination of the Venus axis against its plane of revolution. If I can't see the stars, it is impossible to obtain the data I need for our return trip within the time we still have left. And if I can't get those facts, we'll have to stay here another six hundred days."

Lindner leaped from his seat, his cigar dropped from his hand. Meixner picked it up and returned it to his friend. "Don't get excited." He cut Lindner short before he got started. "Here's one thing: from sundown to sundown tonight 23 hours, 21 minutes, and 16 seconds elapsed terrestrial time."

"Seventeen seconds," corrected Taussig. "But what good is that? That was three hundred miles north of here on top of a high mountain. The length of the Venus day proves nothing."

"What keeps you from rising?" argued Meixner. "Why did you have to pick the sea level from which to observe the sky? And then, the constant rocking?"

"Right you are. Let's go up. Tonight it is light; perhaps we can find a mountain on an island fit to serve as an observatory."

"Let's go then."

Taussig nodded and went to the controls. As they left the surface of the water, the room darkened.

Martin and Lindner retired for the moment. Meixner and Taussig remained in the control room. Their craft was heading south at half speed, about one hundred and fifty feet above the water.

Meixner was lying flat on the floor window, devoting his attention to the water. Since Taussig seemed not inclined to engage in a conversation, Meixner said after awhile that he was sleepy and felt like going to bed. He asked Taussig to wake him if and when he was needed.

Meixner did not know how long he had slept when someone called his name. On hearing it again, he awoke completely and went over to Taussig at the controls.

"Please go up to the platform, or to one of the side windows and find out whether you can see any stars," the latter addressed him. "I think that I can see reflected light from them through the floor window, but I can't abandon the wheel to make sure."

Meixner went to one of the side windows. The sky was brilliant with stars. The air was cool and crisp and the night brighter than any full moon night on earth. High up near the zenith a star shone which he could not remember ever seeing on earth. It was greater than the others and more intensely brilliant.

"Taussig, I am seeing a whole lot of them, and I believe I found Mother Earth amongst them."

"I am very anxious to see that," replied Taussig. "Just now we are above a high insular mountain, where we might attempt a landing. It is about midnight, Venus time, according to my calculations. Tonight is not of much use anymore. If we can land, I will take a look at the firmament, and then retire myself. I'll get up again at sunrise, though."

The *Astraea* was still rising, the motors were working at half speed. Now they could overlook the whole island, but despite the comparative brightness, they could not discern any details.

About three hundred feet below them they saw the rocks of a peak. The *Astraea* went down within about forty feet of it. Meixner turned the floodlights on the rock.

"What do you say? Are we going to try it?"

"No, let's go back to the ocean and land tomorrow morning."

"Why? What is wrong with this place? Seems ideal to me."

"Take a good look at the plateau. See that crevice there. Turn the floodlights on it. Notice something moving in there. Looks like an animal cave."

"Let's turn on our varium tubes, then."

"We don't know whether it will work on all Venus animals. It failed on terrestrial mollusks. I wouldn't care to take such a chance at night."

● The ship sank into deeper layers of the atmosphere.

"Well," said Meixner. "Here we are above the ocean. Do you hear it? That is the breakers."

The noise became more and more feeble as they went away from the shore.

The *Astraea* once more settled on the water's surface. The same brightness again illuminated the room. The ship began to rock slowly.

"That won't do," objected Meixner. "Turn the ship 90 degrees."

Taussig followed his advice. "Suppose we are in a current now like the Gulf Stream; we might be shattered to fragments while we are asleep."

"Just think of it. It's a wonder that you have not already succumbed to fear."

Taussig reflected for a moment. "You're right. No cliffs around here. Those currents are slow. If one of us stays awake, nothing can happen."

"I'll stay up, don't worry," said Meixner. "Go to bed; I'll remain at the controls."

Taussig lay down on a mattress on the floor and fell asleep immediately. Meixner, from his place at the controls, devoted his attention to the water through the floor window. He could now discern thousands of tiny organisms in lively motions. Light emanated from all of them. They were of varying size and shape, spherical, rod-shaped, some like bands, etc.

Then a spherical, apple-sized mass of slime shining with a reddish gleam came within his field of vision. Everywhere around it such masses were forming. All these small spheres consolidated into one big mass which soon covered all of the floor window, filling the room with a reddish hue which gradually changed to purple.

Alarmed, Meixner turned the wheel to the right, lifting the *Astraea* a few yards from the surface. The luminous mass slowly came off, at the edges, first, and then fell back into the water like a large purple ball.

Meixner was undecided. Should he return to the water and jeopardize the safety of the ship? Was it not within the realm of possibility that such a slimy mass might dissolve away the floor window, the Achilles' heel of the ship, with some form of caustic acid? And to remain in the air just above sea level would require the closest attention on his part without a minute of relaxation.

He finally decided to go up about 3,000 feet.

There he saw in the west a reddish shimmer on the horizon which he had not noticed before. He directed the ship toward it. The peculiar coloration drew nearer, soon occupying a great portion of the horizon. He awoke Taussig. His companion's alert interest and fancy immediately expressed the possibility of a volcanic eruption, or perhaps an extensive forest fire.

Taussig went to the platform armed with his binoculars, to make sure about it.

He had guessed right. It was a volcano in full eruption. He could distinctly make out a mountain of conical shape, from the top of which flames were emerging. They were red, but there were also lightning-like streaks of white, blue and violet. Higher up, there were dense clouds of boiling steam, smoke, and low-hanging rain clouds. The startled observer could also see the flow of white hot lava writhing in snaky curves down the mountain side. As the *Astraea* drew nearer the scene, he was able to detect a burning odor in the air and felt a drizzle of fine ashes settling on his cheeks.

He descended to the control room, made a brief report, and handed the glasses to Meixner, whom he relieved at the controls. Without wasting any words, he turned the *Astraea* around and then went down close to the water.

The ocean had lost its shining splendor. Only a dim glimmer betrayed the water's surface. It had grown darker. The stars were invisible, the atmosphere was oppressive and unusually close.

Then, without warning, the ocean began to boil violently, so it seemed. Like a gigantic soap bubble, a great spherical wave rose directly out of the water and would have reached the ship, had Taussig not jerked the wheel to the right at the very last instant.

Taussig continued to rise as fast as the ship would go. Deafening thunder hurt their ears. Phosphorescent fog enveloped them; they must have gotten into storm clouds. There were blinding flashes of lightning everywhere.

"Meixner, Meixner!" Taussig yelled at the top of his voice, "shut everything!" In a moment, Meixner had obeyed and was back again by his side. Taussig clung desperately to the wheel. They were headed directly toward an enormous, luminous ball. There was a terrific peal of thunder. Taussig felt the wheel being ruthlessly jerked from his hand. He lost consciousness.

● When Taussig awoke, he felt exhausted and very weak.

Total darkness was all about him. He rose and tried to turn on the lights; they did not function. Then he tried to start the motor. That failed.

"Where am I?" his thoughts began to scramble through his whirling brain. He attempted to reconstruct the happenings of the last few hours. Yes, they had been struck by a powerful bolt of lightning. He had lost consciousness and the control of the wheel. The wheel, no doubt, had dropped over to the left then and charged negative. Why, the ship must then have fallen into the ocean, maybe even to the bottom of it. He was hearing now a distant roar and thundering sound. What was it? Oh yes, of course, a volcano was in action during the storm. They could not be very far away from it.

Taussig shuddered. What to do? Above all, he must raise the ship. If all the varium elements were discharged, the ship would rise to the surface of itself. He groped his way to the wheel and turned it into neutral. A slight disturbance, and then quiet again. But the faint noise that struck his ear told him that the craft was rising to the surface.

Now a faint glistening caught his eye, rapidly growing more distinct. Then sunlight almost blinded him. The *Astraea* had shot out upon the surface and was immediately seized with a strong rocking motion.

Taussig looked about him in the ship. Meixner lay on the floor, unable to rise because of the rocking.

"For heaven's sake, take the ship off the water. I can't get up."

"No juice. Try to start the static generator. The motors are dead."

Meixner crept over into the engine room and managed to start the generator. The lights flashed on and the motors began to whir.

No sooner had the *Astraea* risen into the air, than she became the plaything of a cyclonic air current, which made steering impossible. Taussig kept rising, the *Astraea* all the while whirling about dizzily, until at an altitude of 6,000 feet he regained control of the ship. There, too, a heavy gale was blowing, but it was of constant direction.

"Phew!" whistled Meixner, getting up on his feet. "What the devil was that? Never experienced anything like it before."

"Lucky we closed all the windows at the last moment. Otherwise we'd be on the bottom of the ocean, drowned like so many rats. Look after the others now; I can't leave the wheel."

At this moment the door of the other cabin was opened and Lindner and Martin appeared.

"A nice way to wake us up. We've been lying on the floor, God only knows how long, until we could finally get up."

Taussig related the events of the past night very briefly.

Martin nodded in ill humor. "Just my luck. When

something exciting or dangerous is going on, I would sleep through it, and have to have it told to me the next morning. Well, let's forget about it."

"Let's hunt for the landing place we rejected last night."

The *Astraea* rose another thousand feet. They soon found the island with the high, rocky peak, which took up the greater area of the island.

The *Astraea* taxied to a stop on a little rock plateau. As they now noticed, the island was richly covered with woodland. There was a crevice in the plateau, quite obviously the entrance to a cave which seemed to lead downhill into the interior.

Taussig glanced through his glasses at the opening.

"Why don't you land?" asked Martin

Taussig pointed to the entrance.

Martin nodded understandingly. "Keep close over it. I'll drop a gas bomb."

A mild explosion followed, with a subsequent generation of generous clouds of smoke. They waited ten minutes but nothing happened. The *Astraea* was landed.

They were now seated, their guns between their knees, steaming coffee before them.

Abruptly there was the sound of wings. Two giant animals came hurtling through the air, pausing before the cave, then disappearing within it. They were a bit larger than the ant-like creatures. They stood about ten feet high, had a trunk and ten extremities. The uppermost projected at the side of their eyes like two large feelers. They walked, supporting themselves on four legs and the pointed, posterior part of their bodies.

The two animals soon emerged from the cave, staggering and stunned by the fumes. Martin raised his gun, two shots rang out in quick succession. The beasts swayed, fell, and turned over dead.

A further program was then discussed. Meixner and Taussig were to remain on board while Lindner and Martin were to explore the forest if possible. If they should meet with danger, they were to give the horn signal.

Martin and Lindner left. Meixner grabbed his instrument kit and proceeded to dissect the cadavers. Taussig busied himself with measuring the gravity pull, air pressure, etc., recording all his findings.

Meanwhile Meixner returned overheated from the hot sunshine. He was excitedly carrying two heavy chunks of bloody flesh, which he placed in the central cabin where it was cool and shady. On leaving the ship, he noticed Taussig holding a short ladder in one hand and a small instrument in the other.

"What are you up to?" Meixner asked.

"Preparing to calculate our distance from the Venus equator."

"How can that be done?"

"With Foucault's pendulum arrangement," explained Taussig, adding a detailed description of the principles involved.

CHAPTER XIX

A Temporary Haven

● Four shots close together rang out somewhere in the forest. It was quiet for a few moments, then hundreds of winged creatures emerged from the depths of the woods with much confusion and noise. They were of all sizes. They gathered about the two carcasses on the plateau. Taking no notice of the men nor the ship, they were doubtless occupied with but one thought, food.

Taussig studied the spectacle just fifty feet away from them. He could not help feeling awe at such a paradise of colors. The smallest resembled butterflies except that they possessed regular feathered wings.

Meixner's flare for biology was stirred. His eyes were riveted upon the multitude of "birds" before him. Without relinquishing the sight, he kept communicating his observations to Taussig in terse monosyllables. Emphasizing the absence of bone skeletons in all of them, he was especially attracted by the smaller forms.

"You are right," Taussig was agreeing with one of his remarks, "they seem to be adult forms, and not immature. But I think the variety of species is much greater than you seem to recognize. We might yet come across vertebrates. Don't forget, we have been on Venus only one day."

Again there were shots.

"Our friends are keeping busy. I'll get some drinking water now," Meixner said.

He went back and forth between the ship and a nearby spring on the plateau. Taussig received the water and stored it away in the ship.

Meixner was just about to return on board when more shots were heard, this time followed by the clashing sound of the explosive bullet. Dogs were baying, and then a penetrating howl like they had never before heard. Lindner's horn signal came close upon the howl.

Meixner grabbed a gun, loading it as he ran toward the border of the forest. Taussig leaped into the gun chamber and loaded one of the guns with a shell, aiming at the place in the forest from which the signal seemed to have come.

Presently, Meixner came running back to the ship, behind him the dog with hanging tongue, followed by Lindner and Meixner, then a crackling sound in the trees. A crocodile's head appeared twenty feet above the ground. It topped a neck thicker than a man's body.

The aspect of the beast's open mouth sent shivers down Taussig's spine. Now the whole enormous animal came into view, its head lowered to pick up one of the carcasses on the ground. While the monster was still devouring its prey, Taussig aimed deliberately at the body and fired. He was stunned for a moment by the gun's back pressure, but Martin, who had been facing the animal, said that he saw the shell enter the body.

A second dull report was heard, almost instantly the animal collapsed. The whole affair had taken place in such a short time that Meixner had hardly reached the platform, when he fell into a chair, breathless. Lindner stood beside the ship in utmost excitement. Taussig, still unconscious from the shot, lay on the floor of the gun chamber.

Only Martin seemed to have preserved his equanimity. Calmly he strolled toward the ship, gun in one hand, and climbing cane in the other, his shoulders laden with a number of things—fruits, leaves, and three "birds."

They all had finally recovered from their excitement. The winged creatures that had fled at sight of the saurian now came back one by one. More followed. By the hundreds, they were eating away at the dead beast, a noisy chatter accompanying their activity. Some of them even took an interest in the *Astraea* and its occupants, exhibiting no shyness.

After another five minutes, the four friends were together on the platform. They shook hands and congratu-

lated themselves over a glass of wine each to the fortunate outcome of their dangerous adventure.

"Now what?" asked Lindner.

"You fellows ought to tell us what happened to you. After that, we will take a good look at the saurian and then have lunch. I'll also make a few solar photographs."

"You mean for us to stay here among all these animals?"

"Why, are there more of them?"

"Are there? The lowland behind the forest is alive with them. As we were beating our way through the bush, we were suddenly in a whole swarm of insects. I caught some of them and put them in my specimen box. I lost it in my hectic scramble to get back to the ship. Some were most unusual forms; large eyed, some with eyes on the side of their bodies, or a third eye on their backs, in short, a whole jumble of monstrosities from the size of a fly to that of a butterfly. We went on, and then we destroyed two cobwebs and the spiders that belonged to them. Then we shot a branch from a tree. It bore a fruit like an apple.

"Where is the fruit?"

"The shell cracked when it fell from the tree, so we left it there. Then we got into a regular forest of high trees. The low bush had disappeared, and there was no more of the sap-laden grass. Thick, dark green moss took its place. The atmosphere was cool and pleasant, and plenty of space to move about. There were a few flowers in amongst the trees arrayed in a wealth of colors, tall as man and on stalks as thick as your arm. Their fragrance was almost like a narcotic. I cut one of the stalks, and a thick, pleasant smelling, milky fluid was emitted from it. That fluid hardens to a gummy substance when exposed for a little time.

"Insects were busy about the flowers. The ground was alive with creatures like turtles of all sizes and shell colors, green, red, brown and gray. Their crusts were artistically patterned and sometimes three feet in diameter. I shot one of them. In dying, the thing cast a vile smelling stench all about. Martin thought it was a giant wood louse or something. He was still convinced that there could not be any vertebrates on Venus."

● Lindner stopped, took a deep breath and a draft of wine, and then continued. "The place was so nice that I felt like lying down and taking a rest out in the open. But after all, that is not what we came here for.

"We had reached a clearing. Below us, we noticed a sort of green meadow with something moving in it. A huge fruit fell from a tree and dropped into the supposed meadow. The water splashed high and the fruit vanished into the ground. We knew then that it was a swamp with a blanket of green plants on its surface. We saw all sorts of weird heads protruding from the swamp, like crocodiles, some like snakes, others like hippopotamuses.

"Martin retreated behind a tree, dragging me with him. We loaded our guns with explosive bullets. The head of the monster appeared, then the neck. The beast pursued Bello, who sought refuge with us. We now thought it time to intervene. Our guns aimed and fired simultaneously. Whether we hit or not, I don't know. Then we saw all of the big beast. It had four members and a long tail, thinning toward its end. It beat the life out of everything within its reach. On running back, we gained quite a distance on him, because through the trees we were easily able to move unimpeded, while the saurian tore down a few trees, blocking his own path in his blind rage. The rest you know yourself."

"Well, that's that," summarized Taussig. "Let's talk about the possibility of the beast being a vertebrate later. What now?"

"Let's get the things Lindner lost on his flight through the woods," Martin urged. "His specimen box and the fruit I shot off the tree. Are you coming along, Taussig?"

"Sure thing, let me have your saw. I want to take a look at that blamed saurian."

"I am going, too," said Lindner.

The three friends were on their way, accompanied by Bello. Meixner stayed on board.

Furiously barking, Bello ran toward the dead saurian, scaring away some lingering winged creatures. The dead animal was a hundred feet long. On closer examination, the head did not greatly resemble that of a crocodile. It looked more like a bird's head greatly stretched. The head was ten feet long, the beak itself measured seven feet. It was of a greenish yellow color and lined with several rows of toothy projections. There were no nostrils. There was a wound above the right eye, but the eye itself had suffered no injury. The neck, eighteen feet long, was covered with horny plates and consisted of sixteen members like wings, about nine feet in diameter.

Lindner and Taussig pried between two of these with one of their spears, breaking one of them loose. They could use the knife for further procedure. "You see," said Taussig, "it's not a vertebrate. It has no spinal cord, only a skin skeleton. Let's hurry, though, I have to be back on board in a half hour."

"Why?"

"I must try to make a picture of the sun."

Lindner picked up his specimen box where he had lost it. Then they all returned to the ship.

Taussig was preparing to catch the sun on passing the meridian.

"Sometime, we will have to look at the coastal formations," suggested Martin. "The tide is quite high here and can't be without influence on the geological formation of the coast. And the receding tide certainly leaves a lot of marine organisms behind. There might be a lot of interesting things to be learned from these amphibians."

Taussig, meanwhile, had adjusted his camera, and was waiting for the proper moment.

Meixner had joined the others on the platform. While Taussig's attention was occupied by his camera, the others were enjoying the view.

Noon had arrived.

"Gentlemen," began Taussig, "I think my chronometer is correct. The sun passed the zenith at 49 degrees, 30 minutes. That means that we have found the meridian and the declination is 12 degrees, 15 minutes, 30 seconds on the southern hemisphere. If we have a clear night, I will be able to say with certainty that that is correct and put it on record. The ecliptic of Venus I'll also probably know then."

"Do you know, then," asked Meixner, "our exact distance from the equator?"

Taussig laughed loudly. "And that coming from you, the representative of an intelligent profession? Incredible! How should I know how high the sun is above the

equator? Tomorrow I'll be able to tell that by the Foucault pendulum test."

"Then what?"

"Then we will have to decide whether we'll immediately proceed to our starting or whether to do some more scouting around Venus."

All the excitement of the day could not lessen the appetite of our explorers. They did full justice to the meal. Taussig declined a demitasse, and said that he wanted to get some sleep. He had to be awake later during the night. Meixner, too, declared himself in favor of a few hours' nap.

The two others cleaned their guns, which kept them busy for hours. At four o'clock they aroused Meixner, asking him to take charge of the ship while they went in search of meat for dinner.

Meixner amused himself on the platform with one of the winged animals he had caught. He carefully excised the nervous system. The bulk of it, a sort of brain, was located in the lower part of the body. Only a small nodule in the head, from which five strands went forth into the body. Then he extracted an eye, of which he prepared microscopic sections after freezing it in solid carbon dioxide gas. He imbedded them in paraffine. The eyes were of the facet type, like those of an insect, eight facets with a lense for each eye. A minute muscle took care of accommodation. It represented a combination of fish and insect eyes.

● He made a careful study of the retina, and prepared numerous tissue specimens in bottles with a fixing agent. "Enough work for five hundred doctorate theses," he commented to himself. With the same exacting care he prepared sections of the wing substance, and was so absorbed in his work that he did not notice Lindner and Martin returning until they stood right beside him on the platform. He was all excited over the unusual discoveries he made within such a few hours. As the sun was sinking, it was time to think of getting dinner, and with a sigh, he put away the implements of his scientific activity.

The sun sank below the rim of the ocean.

The four gathered in the control room for their meal. Just after they finished, they went up to the floor platform to get a breath of fresh air.

"What the deuce is this?" exclaimed Martin, pointing to three inches of water covering the floor of the platform. The telescope and all other objects on the platform were dripping wet.

Lindner laughed. "That's probably the evening dew. The strong solar radiation prevents the formation of rain clouds. After the sun goes down, the moisture settles in the form of a very heavy dew."

"Humph," grunted Meixner, wiping dry a seat on the bench, "Taussig and I were dashing around among the storm clouds like Old Father Zeus, himself, last night."

The first stars began to twinkle in the firmament. "Now," said Taussig, "let's have a little peace. You can proceed with your arguments, but let me out of it. Turn the lights off, because the vibration of the motor would confuse all my observations. I'll use my flashlight for writing. The bright light up there is Mother Earth; that is a subject for you to talk about."

The other three did not follow his suggestion, but fell to silence while Taussig was all attention to his task. The aspect of the star-spangled firmament started his companions into a reverie of sober meditation. This task they had accomplished was so bold, that thousands of generations before them had not even dared to dream of it. They could not help imagining what might have happened if they had done the same thing ten years earlier, at a time when Germany was in her glory. What honors would have been theirs? Every English, French and American hall of fame would have offered them membership.

The whole civilized world, which was still a cultural unity, would have acclaimed them. Not a power on earth would have dared to withhold the fruits of their accomplishment from their country.

Meanwhile, world history had made a step forward, but culture and civilization had lapsed into unfathomable depths. Any crime, any atrocity, had, at one time or another, been glorified as an heroic deed so long as it was directed against the Germans. On earth, they would have to hide like criminals and be careful not to let even one word of their secret leak out.

They all played with the thought of colonizing this new world with Germans, should their investigation reveal that it was fit for human existence. But they must bide their time, for at present their country lay bleeding from a thousand wounds, and could do nothing to further their far-reaching plans. There was little hope that the world's conscience would at last wake up and put an end to the shameful oppression. Only the diligent and untiring efforts of her sons could lift Germany from her depths of distress.

Taussig's cheerful voice shook them out of their cogitations. "Boys," he announced, "I got it. Everything is working fine."

* *

Day was breaking. After breakfast, Martin and Lindner left with the dog. Taussig asked them to be back at 9 o'clock, and then continued to devote his time to his astronomical calculations.

Opposite him sat Meixner, gaining his knowledge of the world of infinitesimal things through his microscope while Taussig, from the observation of the giant building stones of the universe, compiled data about their new world.

Both worked eagerly for two hours and paid little attention to what was going on. Finally Taussig arose.

"Well, I am through for the time being." All that he still needed was a solar photograph taken at noon.

Meixner raised his head from the microscope. "What did you find out? But please, no mathematical formula."

"The Venus day is one and a half terrestrial hours shorter than ours. A year has 262 days, 3 minutes, and 52 seconds, every twenty-second year being a leap year. The elliptic is exactly 22 degrees. We are very nearly 30 degrees southern latitude. The sun was at 49 degrees, 30 minutes at noon. That is near Venus Capricornus. It is now winter on the southern hemisphere where we are."

● "Where and when must we start to get to the earth?"

"At one o'clock after midnight from 16 degrees south latitude."

"Does it make any difference whether we start today or in a day or two?"

"It certainly does. Every hour's delay means days added to our traveling time."

"In a hundred years from now, we will travel from

planet to planet in more comfort."

"Sooner than that, I think."

"Perhaps. Tell me, what did your microscope reveal?"

"A lot of interesting things."

"Is Venus habitable for man, do you think?"

Meixner shrugged his shoulders. "I don't know yet. If our country were not so desperately in need of territory I would be against an attempt of colonization. But as it is ———. Here come the other fellows." They boarded the ship. Meixner turned to Martin. "Have you not yet had enough of this blamed island?"

Martin took a deep breath. "No sir. The first carefree hours in years. What are the dangers of a huntsman's life as compared with the humiliation of being political game?"

"Have you finished your calculations?" Lindner asked Taussig.

"Yes. I'll have to check them several times, of course. Some little error might cost our lives. I'll now make a noon photograph of the sun. What did you do?"

"Nothing much. I analyzed the ocean water chemically. It is practically the same as ours on earth, only a bit more concentrated, a slightly higher iodine content and a trace of some metal, the nature of which I could not determine. That was one of my jobs."

"And the other?"

"I have examined the flour that we used for the cake. Microscopically, it has a structure similar to wheat grains. Definite starch reaction and a pure carbohydrate."

"Without any admixture?" asked Meixner, a catch in his breath.

"How do you mean that?"

"Each grain cell consists of the seed cell proper, containing albumen and an outer layer of starch. What I am interested in is the chemical nature of the seed cell proper."

"I have stained the cells according to standard methods. In stained form, or otherwise, they showed no deviation from the reaction of terrestrial plant seed. Here is a slide with sections in five different directions. And there are colored plates of wheat and poppy seed slides for comparison. I could find no startling difference."

Meixner devoted most of a half hour to the examination of the slide. When finished, he took a deep breath. "This is taking a load off my mind."

Martin looked at him in astonishment. "Are you through with your work yet?"

"I'll never be," answered Meixner. "The first time I looked at muscular tissue, I was startled. Amazing, I thought. This is not muscle, but tissue affected with sarcoma."

"Sarcoma?" asked Martin. "An aunt of mine died of it, that is, ———."

"Yes, a malign growth. I then took the liver and examined its tissues. The same result. Any second year medical student would have diagnosed it as cancerous live tissue. Strange, is it not? The liver from another animal showed the same thing. Now something is beginning to dawn upon me."

"I don't understand," said Lindner, hesitantly.

"You see, appearance is deceptive. What is a cancerous cell? One distinct from a cell of the host organism in several respects. It is large, has much protoplasm, little non-living cellular matter, little inter-cellular binding material, and it grows uninhibitedly. A young cell, in one word. Immature cells in a mature organism. That is cancer."

"I read somewhere that it is an infection."

"Perhaps it is an infection that gets a malignant growth started. But that is debatable. I have gained one universal truth from my examination of the Venusian organisms, one which to my knowledge, no one before has ever disseminated. Not only the individual organism ages, but the whole species gets older over generations. The animal which springs today from a germ cell is older than its ancestor born thousands of years ago."

"Why?"

"Its incipient embryonic cell has more skeletal substance and binding matter. So has the animal at birth. Vertebrates are not only more highly developed than mollusks; they are also older as a class. They have much more non-living matter in their cellular structure, e. g., their bone frame."

Taussig asked Meixner to defer the rest of his explanations for ten minutes. He had to take the solar picture.

Taussig carried the telescope to the central cabin. When he returned, he said, "Meixner has made the statement that he would advise populating Venus, were Germany not in such desperate need of expansion. Let's have him explain that."

"Not yet," answered the latter. "Give me a few more hours. I'd hate to make a statement without absolute proof."

Taussig went on, "All right, get to work then. I'll do the same. We'll leave the island tonight. Who's going to take the controls? I won't have time."

"Nor shall I."

"Let's stay until tomorrow, then," decided Taussig. Whereupon, he sat down to his calculations without another word. Meixner went to work with his microscopic preparations, and Lindner made analyses of little stones that he had collected. Martin cleaned out some of the "birds" he shot and tried to preserve the skins with naphtha.

CHAPTER XX

A Venusian Discourse

● The next morning at sunrise, they left the island which had given so much valuable information about Venus. They took a direct course to northward.

Meixner went into the cabin, returning a moment later with a fever thermometer in his hand. "I found it strange that nobody said anything about eating. I myself did not feel hungry, so I took my temperature. It is 103.1. What about yours?"

"What the deuce is wrong with us now?" wondered Martin, putting the thermometer into his armpit.

Meanwhile, Meixner had taken a drop of blood from his finger tip and made a wet mount on a slide. He examined it under the microscope. His flushed in perturbation.

"Look here, Lindner, and tell me what you see."

"White cocci with flagella, moving about very swiftly."

"Correct."

Martin had taken his temperature. It was 102.7. He handed the thermometer to Lindner while Meixner dissolved some yellow dust in water, drew up the solution into a hypodermic syringe and proceeded to strap his arm. A piece of rope served as a hemostat, which Taussig was to hold tightly around his arm until Meixner instructed him to loosen it. He did so after he had inserted the

needle into the tissue, and then injected the contents of the syringe into his arm.

"What are you doing?"

"Now it is your turn," he offered instead of an answer. Then he made the round, giving each one an injection.

"What is this all about?"

"I discovered the whole thing quite by accident. Look here," he said, opening a drawer. "Here are several dishes of Venusian media, and some with terrestrial material. The Venus media have all come down while the terrestrial ones have remained sterile, except for two. These,"—here pointing to two dishes which emanated a dim glow—"contain the bacilli which, on the first morning, caused the luminous fog. The very same have been identified in my blood. They are, to my knowledge, the only microbes pathogenic to man."

"Shall we get over it if the organism is pathogenic, as you say?"

"Certainly, I'll show you why."

He put a drop of the fluid into one of the luminous cultures, by means of a pipette. The gleam began to disappear, first in the upper layers and then all the way down, until the whole thing looked like one of the sterile media.

"That was one drop of a 1:1,000,000 Neo-salvarsan solution (606, after Ehrlich), sufficient to kill ten grams of this culture almost instantly. Each of us got eight grams of a 5% solution. In half an hour we'll all be afebrile."

"How do you know we shall? Have you treated this before?"

"Yes, at sunrise, on the hog. She declined food and ran a temperature. I gave her a 606 injection at random. Now she is eating again."

"Let me ask you another question," Taussig proposed to Meixner. "This kind of infection can easily be combatted, as you say, and other germs do not grow on terrestrial media?"

"Not as far as I know," admitted Meixner.

"Why then do you think a colonization inadvisable? At least, one of any proportions at all? Even with our present amount of varium, we could establish and maintain a regular connection between the earth and Venus. A great number of people properly equipped, could cope with all the dangers of nature even more effectively than we. Or do you think that more fatal diseases are lurking about?"

"I can't definitely answer that. Don't forget that, so far, we have either been on the water or in the high mountains. On earth, too, you find little danger of infection in those places. One can't foretell whether there might not be a number of diseases, concerning the nature of which we haven't the slightest notion. It is rather likely that there would be. Colonization would surely require great sacrifices until man became adapted to conditions."

"Quite true, and almost self evident. One does not have to experiment with microscopic slides to come to that conclusion."

"No," admitted Meixner, "yet, my microscopic examination almost made me think that the population of Venus is entirely impossible until Lindner dispersed my doubts."

"How was that?"

"Well, you see, animal tissue on Venus has a different stain reaction from that of earthly tissue. On earth, a muscle would stain red with eosine, while the corresponding tissue from an animal of Venus would take on a green shade from the same treatment. That is only one of many examples."

"What do you conclude from that?"

"Difference in the chemical structure of the Venusian protoplasm from that on earth."

"Pardon me," interrupted Taussig, "is the protoplasm of all terrestrial cells identical?"

"Practically, yes. There are individual characteristics, of course, in the proportion of the components. The same thing also applies to serum, for instance. But that is getting us into serology."

"I think that I follow you so far," averred Taussig. "One could then conclude common origin from those similarities."

"Certainly."

"What is the common origin of life?"

"The water of the ocean."

"Then your chief conclusion is that the chemical composition of the ocean water of Venus is different?"

● "Yes, and Lindner will confirm that."

"That's right," verified Lindner. "I told you all about it yesterday."

"What are the implications of that?"

"Man, living on Venus, will ingest with his food certain minerals that are unfit for his system. Lindner has spoken of milligrams. But a milligram more of fluorine, or less of iodine, over years would lead to a chronic pathological condition and finally mean destruction."

"We could transplant terrestrial animals and plants," Lindner hinted.

"We'll have to. Whether terrestrial animals can feed on Venus plants, ———."

"It is doubtful if terrestrial plants will grow in the Venus ground."

"Why shouldn't they? Plants take from the soil only what they can use."

Taussig suggested: "Let's take a few tons of Venus humus along and see whether terrestrial plants will grow in it. We'll also plant seeds from Venus in ground from our earth. I don't believe that we'll get along without any terrestrial plants and animals at all. After we get back to earth, I hope to have a fair idea at the time of the next conjunction whether or not a colonization is advisable."

"It'll be a hard fight," Meixner reminded him, "a desperate fight for life between a world of old cells and one of young, strong ones."

The four men had been absorbed in their discussion of the possibility of colonizing Venus when, after a time, they noticed a small, black cloud in the north which was growing rapidly larger. As it drew nearer, Lindner called Taussig's attention to it, remarking that he had observed a similar cloud following them from the south for quite a while.

"Confound it," expostulated Lindner, "those Venusian ant creatures again. They want to give us a thrashing. Let's get up real high."

The *Astraea* rose with celerity as the two clouds quickly came close to them. They had now come to a stop at some distance from each other. A regular battle formation of their forces was unmistakable. The two armies were estimated at 15,000 and 18,000 respectively. Taut with excitement, the *Astraea* crew waited for things to happen. On either side, a detachment of mounted troops left their fronts and met between the two lines. They were seen to

gesticulate with their trunks and extremities. Then they returned to their lines after some sort of brief communications.

The negotiations must have been unsuccessful, for soon a deafening roar reached the *Astraea* and a merciless battle was launched. The two armies met with terrific impact. They fought each other with large sticks which they wielded with precision. The ones that had become entangled, tried to kill each other with a deadly embrace effected with their trunks. The ones above the zones of main activity were hurling javelins.

Transfixed by the sight, the men looked down on the fighting, screaming multitude.

"Here is a war for you," said Taussig to Lindner, sarcastically. "The battle after unsuccessful negotiations. *Tout comme chez nous.*"

"How do they distinguish between sides?"

"The northern army seems a shade darker than the rest of them."

"How long are we going to stay here watching a horde of dumb beasts battling each other?"

(Illustration by Paul)

It looked like a long thin rope. The part on the ground was thicker and kept swelling. The ship was suspended above the strange creature.

"I think it is extremely interesting. Just look at the northerners walloping the others!"

The battle was certainly all in favor of the northern army. The other army was soon forced to seek safety in flight, the enemy close at their heels, pursuing them with much screaming noise. After they had gone, the vision to the ocean was again unobstructed, and upon it were littered the dead bodies and wounded combatants of both sides.

"Do you call these creatures dumb beasts?" taunted Lindner. "Did you not notice their intelligent strategy which would have delighted any military expert? Their perfect maneuvers?"

"At any rate, they did not seem to be very humane. The wounded simply fall into the ocean and are left to perish in their helplessness."

The *Astraea* continued on its interrupted course, going steadily northward. Meixner was interested in going below to study the marine fauna again. They had been below for awhile, marvelling at the multitude of species, when Meixner pointed out a group of creatures that were closely following the ship. They were like eels with elongated, flat bodies and heads suggestive of terrestrial fish.

"Take it slowly," he shouted, "I want to catch some of these things." He opened one of the outside windows. Soon some of them appeared between it and the inside opening. Meixner closed the outside window again, and just then, their attention was arrested by something else.

With incredible suddenness, all animals had fled and as far as the eye could see, the water was deserted and void of all life.

"Ah, that must be a shark,—stop!" commanded Martin.

Saying this, he dashed into the gun chamber, loading both guns with torpedoes. The *Astraea* had come to a stop and was now going in the opposite direction. And there was the enemy hovering into sight. What dwarfs are the sharks of the earth as compared to this gargantuan monster that took up their pursuit! The whole field of the flood-lighted water was occupied with its massive body, snowy-white, sleek, and cylindrically shaped. Its diameter appeared to be about thirty feet. The body ended in a huge head equipped with six flashing eyes, each the size of a soup plate. From the enormous mouth, in which the *Astraea* could be carried, a torrent of water was emitted, mixed with air bubbles.

The water became abruptly calm. "He will close in any moment now; get the torpedoes ready."

The projectiles were electrically discharged. Instead of waiting for the explosion, Taussig jerked the wheel to the extreme right, and in a moment the *Astraea* was high above the surface.

Taussig stopped. He wanted to observe the effect of the explosion, secretly hoping that the corpse of the monster would come to the surface. Nothing happened. Evidently, man's most destructive weapons were of no avail against this despot of the oceans, and probably they could only thank their quickness of action in escaping for being still alive.

The *Astraea* was heading for an island in a north northeast direction. Taussig hoped to reach it before noon because he wanted to determine their bearings.

"Isn't it strange," commented Martin, "how strikingly alike all these insular formations seem to be? One or more high mountains on each of them, steep coastal lines everywhere, and no gradual transition in the form of the beach."

"Yes," Meixner answered, "they are all of eruptive formations. No layers or sediments. Everything here is young, very young."

"There is an active volcano for you right over there."

The whole island consisted of a high mountain. Three peaks reared their heads from one part of it. Out of one of them poured clouds of smoke. Another one was cold and completely barren. They paused above it, enjoying the panorama.

A hot spring was running, bound for the ocean, from between two of the peaks, sending out sulphur fumes. Between two of the mountain ridges was a low area covered with ordinary trees. Farther down there was a flat field. In its center was a huge hill with numerous approaches, in appearance much like the South African termite hills, except for their size.

Taussig was busy again with calculations. Meixner was preparing lunch, dallying with the fishlike creatures he had caught between the windows. Martin and Lindner were earnestly discussing things. The call for lunch terminated their conversation, when all gathered about to eat.

The third course consisted of the "fish." "Note, gentlemen, you are about to eat the very arch ancestor of the human race, which will evolve into a population on Venus like ours is now. Millions of years from now, of course. This is the first suggestion of a vertebrate in the making which I have found here. Evolution, then, is occurring here in a manner and tempo similar to that on earth."

"But the plant kingdom is so much farther advanced," said Taussig.

"Not as much as that. We have simple forms throughout, though theirs may be gigantic compared with ours. All these big trees are green and filled with sap. I haven't seen any non-living matter in them yet, such as bark."

Martin threw his hands up helplessly. "From those few cartilaginous plates and the skins, you conclude that an undisturbed course of evolution will bring forth in the remote future a population of intelligent human beings, with cities, fields, and railroads displacing the jungles?"

"Not necessarily human beings with articulate speech, erect attitude, etc. The skins and cartilage plates only indicate that a similar trend of evolution is moving toward vertebrate forms. As the temperature decreases, the giant forms degenerate into smaller sizes. Thus some day the prototype of Venusian man may be chased from the paradise of ignorance, perhaps, at the same time that the last human being on earth succumbs to frost and hunger."

"Well, well, old Meixner is growing sentimental," teased Taussig. "Don't let that worry you, though, we still have quite a few years of grace."

"Taussig," addressed Lindner, "what time are we going to get to the point from which we'll make our start back to earth?"

"If we keep going until nightfall and start again at sunrise, we ought to be able to make it by noon tomorrow."

"When shall we start?"

"One hour after midnight."

"So we'll have a little time for exploration this afternoon?"

"What exploration?"

"Just a moment,—what do you think those hills are down there? Dwellings of ant-men, don't you?"

"Yes, I have often noticed those dwellings being located

on a plain with no trees anywhere around. They are probably uprooting those trees for the same reason that primitive man on earth erected lake dwellings: protection from wild animals."

"I don't think that that is the reason," argued Meixner. "The hills are isolated because the subterranean activity of rodents undermines any vegetation when it first takes root."

"Be that as it may," Lindner said, "but it would be a shame if we have to return to earth with such scanty knowledge of the Venus people. I really do feel like going over there and taking a good look at the place. No danger in it."

"Are you mad? I suppose you want to see whether their furniture is Victorian or Biedermaier?"

"All joking aside," begged Martin, "we want to know whether they all live in individual cells, where they keep their domestic animals, whether they raise them as we do or capture them in their wild state."

"Probably there is not much danger in it," went on Lindner. "The whole colony is likely to be deserted. The inhabitants might have gone south with the victorious army of the north."

"That's a real plot against us, Meixner," accused Taussig. "It's enough to drive one mad. These two thickheads insist on invading an anthill where each ant is just as big as they are. The idea has no practical value at all. As long as we thought that those animals might be domesticated, there was some sense in investigating their habits. But that is not the case now, and your plan is sheerest foolishness. Your lives are too valuable to us for me to support such a crazy idea of jeopardizing them."

"But if there is no danger in it?" persisted Martin. "If the dwellings are really deserted?"

"How are we going to find that out?"

"Simple enough," Meixner came to their assistance, "we'll drop a bomb into it, and if nothing happens, let them go for all I care."

Taussig yielded in the hope that the ground dwellers would swarm out by the hundreds after the bombardment, dissuading his friends from their bold plan. He aimed and fired. A dense cloud of dust was thrown up, mixed with the fumes of the explosion.

When the cloud had settled, the dwellings presented an entirely different appearance. At least a third of their height had been torn away. Holes and tunnels everywhere, but no sign of life.

"All right, in heaven's name go then," replied Taussig to Lindner's demanding stare, "I'll take you down there."

"You know, Taussig," said Martin, "your incessant over-anxiety is becoming a bit irritating. You act like a sixty year old governess. Let's get started, Lindner. You know that we haven't walked five miles on Venus yet."

CHAPTER XXI

A Great Discovery

● The two adventurers left the ship. The dog ran ahead of them. Taussig started the motor, loaded both guns, and joined Meixner on the platform, who was keeping an eye on his companions moving about the dwellings.

"Well, I don't quite see your objection myself. There really seems to be no danger. But look, what's the matter with the dog?"

The two men halted. Fifteen steps away, their dog was apparently alarmed about something for he kept pointing his nose first to the ground and then into the air. He seemed to follow a certain trail and approached one of the few trees on the grounds. Then he gave out a loud howl, collapsed and rolled over, stretching out prone on the ground.

In one leap, Taussig was at the wheel. "Meixner,—quick, the oxygen tanks!" In a few moments the *Astraea* was at the spot where the dog had fallen.

Meanwhile, Martin and Lindner had rushed to their four-legged friend, thinking that he was struck by a snake. They stooped, swooned, and in another moment fell to the ground burying the dog beneath them. The *Astraea* landed two seconds later. In a mad rush, the lifeless forms were taken aboard and the *Astraea* leaped into the air. The two oxygen tanks had rolled overboard and lay at the foot of a tree.

Meixner examined their eyes and took their pulses, stating with professional calmness, "They are all alive but insensate from some narcotic. It smells like chloroform with another mixture I can't identify."

"Chloroform?" questioned Taussig. "You know when I saw the dog overcome, I thought of the 'dog grotta' near Naples. The breaking of a carbon dioxide spring might have chased the dwellers away. That was why I asked for oxygen right away. Now you tell me that it is chloroform. The most important question, though; Will they pull through?"

"I think so," Meixner replied hesitatantly, "if I only knew what the anaesthetic was; chloroform alone couldn't have made such a quick job of it."

"How will you bring them around?"

"Just rest, and fresh air. The pupils are beginning to dilate again and are reacting properly."

He disappeared into the third chamber, returning with a gas mask and a small carbon dioxide tank.

"What's the tank for?"

"You got me started on an idea. I'll go get the objects they left behind and fight the enemy with its own weapon. I am convinced that it must be some animal."

During the conversation, a strange creature appeared in the tree. As it lowered itself from the crown some three hundred feet above the ground, it looked like a long thin rope. The part on the ground was somewhat thicker and kept swelling while the remainder on the tree grew thinner. The connection between tree and ground was finally severed, and a grayish red, spherical mass the size of an elephant rolled from the foot of the tree to where the guns and oxygen tanks lay.

Taussig was quite calm. "Let's not take unnecessary risks. If you can pour liquid carbon dioxide on the huge mollusk from the gun chamber, let's try to fight him."

The ship was suspended just above the strange creature. A strange fight ensued, one between nature in the raw and human intelligence. From a multitude of orifices a light colored fluid spouted upward from the animal. It did not reach the ship, however, because it evaporated too quickly At the same time the icy cold stream of gas pierced into the deep holes in the jelly-like mass of the beast. The battle was soon over. The monster fled. He split up into about thirty separate spheres, uniting again about a hundred feet from the scene. Instead of consolidating into one mass again, the spheres disappeared into the ground beside each other.

"No sense going after our things now," said Meixner,

"the iron part is bent and the wood taken off altogether. Let's go on."

The ship left the island again. Martin and Lindner were sleeping soundly while Taussig was at the controls, now and then exchanging a remark with Meixner who was busy with his preparations.

The sun was sinking when Taussig sighted a cliff. It turned out to be an island. The *Astraea* made for it. There was a high peak, totally barren. They circled it three times before they sighted a suitable place to land. It was a plateau 5,000 feet above the ocean.

"We'll be safe here from any intruders," Taussig promised. "Let's see how our friends are doing."

They found them still asleep, but the dog was beginning to wake up. Martin and Lindner were a little hard to rouse but they felt refreshed and not a bit drowsy. Just like after a beautiful sleep rather than under the induced sleep of an anaesthetic. Their minds were alert. They looked at the sun, and the strange new surroundings with astonishment, and could remember nothing of the circumstances of what had happened.

Meixner told them briefly what had happened.

"Very humane idea, though," commented Martin in good humor, "to narcotize your victim first so it can't feel the operation."

Taussig laughed. "Who's been too careful now?" as he looked at Martin.

"Stop tantalizing each other," intervened Lindner, "how long are we going to stay on this planet?"

"We'll leave tomorrow night for sure."

"I'll take the night watch this time. I feel well rested."

● Thus the last day approached that the four friends were to spend on the strange heavenly body.

Late in the day they started for the point from which they were to undertake their return to earth. They were barely 400 miles away from it.

The lone isle had soon vanished from sight. They proceeded in lower layers of the atmosphere where the propeller would be more effective. Martin was at the wheel, Mixner before his beloved microscope, and Taussig at a little table checking his figures for the tenth time. Lindner sat beside Martin staring into the waves of the ocean five hundred feet below.

Now that the hour of departure was close at hand, a feeling of forsakenness came over the observer. An endless waste of water and nothing to break its monotony. No dolphins, no flying fish, no trail of faithful sea gulls, no swallows, nothing. Was the *Astraea* really moving on her lone path? Only the low hum of the motor and the slight vibration of the ship bore testimony to its motion.

The *Astraea* had gone a little lower and was proceeding close to the high waves. This was at Lindner's request.

Taussig put down his pencil and joined Lindner at the window. He was looking pensively at the ocean.

Lindner welcomed the opportunity to begin a conversation. Meixner was one person who enjoyed talking, so Lindner knew that he would not be disturbed by it. He pointed to the wild ocean. "Notice how stormy the sea is today?"

"No more than usual, I believe."

"This is the first time I noticed it."

"I can't understand that. I have always seen the sea rough while the sun was up. It calms down only after sundown. It is the high tide. The solar attraction is more than on earth, you remember, and weight is one-fifth less. These tidal waves will, in the course of time, make a moon of the planet."

"How?" Lindner was interested.

"Don't you see that all this friction must counteract and slowly consume the rotary kinetic energy of the planet?"

"Is that a universal law, true for the earth as well?"

"Positively."

"Is the increase in the length of the day, which would be the inevitable result, calculable?"

"Yes, it amounts to so many seconds in a millennium."

"Then there is no imminent danger on either Earth or Venus."

Accidentally they hit the crest of an unusually high wave. Martin threw the wheel to the right.

"You can't do it. There's no comfortable flying below 500 feet."

Lindner looked at the clock. "11:30, Taussig."

"Right."

"Aren't you going to take the bearings?"

"Of course. I'd like to do it from an island or from the continent. Let's go a little higher if we can't see an island."

A most unusual discovery was awaiting them. In going up, they had already a distant point in mind in the ocean. Coming closer to it, it revealed its extraordinary shape and appearance.

It was a huge block of pure crystal nearly ten miles in circumference, and 3,000 feet high. A natural tunnel had been washed out with a width of one and a half miles. The two supporting arches stood opposite each other exactly in the north south divide. Great quantities of water were gushing through the tunnel in an east west direction.

The *Astraea* circled around the colossal crystal block. The blinding reflection of the sunlight made it impossible to gain a correct impression of the shape of the top. There was no trace of humus or vegetation anywhere.

The *Astraea* went around the top plateau, which still measured a good mile in circumference, and then rose above it, flying over it in the still air at a very slow speed.

In the center of the crystal plateau the *Astraea* mirrored itself clearly and without distortion in its water surface. Amazed, Martin stopped the ship and slowly descended to the shining surface. While Taussig prepared to take bearings, the others contributed their efforts toward making a meal.

After awhile Taussig reported, "We are twenty miles south of our starting point. I am in favor of staying here for the time being. We are safe here. Our new island certainly looks strange from the platform. Have a look."

The four men went to the platform. Vision was unobstructed to the northward. On all other sides were the glistening, light refracting peaks of which the island consisted.

"Do you know what material this is?"

"No idea."

"Maybe there are diamonds," suggested Meixner eagerly. "Why don't you break off a piece and examine it?"

"There is a good-sized block of it lying loose. I'll get the ship over there and you pick it up from the ship."

When the men entered the central cabin, their eyes be-

gan to hurt from the blinding effect of the reflections. Their heads swam and they thought they saw stars. Nevertheless, they hoisted the block of crystal into the cabin with great effort. Lindner chipped off a small piece and put it into several solvents. The meal interrupted his scientific investigations. Right after he resumed them again, searching for the chemical and physical properties of the unknown substance.

It had not dissolved in any of the fluids, nor would it react with gases. It seemed harder than anything in Mohs' scale and scratched a diamond. Its specific gravity was 5.5. It crystallized in pointed needles, was water clear and double refractory.

Lindner tried to burn it but without success. He had to apply the electric arc to make a splinter of it evaporate. At last, then, some reaction. He repeated the experiment, this time collecting the vapor in a cooled glass tube. The whitish smoke condensed to a heavy, greenish powder.

"Why, this must be——varium oxide!" Meixner faltered.

"Varium, eh?" Martin echoed after he had recovered from his surprise. "Looks like an act of Providence, doesn't it? The first day that you discovered varium on earth, Taussig had the idea of utilizing it for a trip to Venus, and now on the last day of our stay on this planet, we find huge quantities of it right here. But why is it in crystalline form, and also inert to oxygen, so unlike the metallic varium we found on earth?"

"Varium is evidently polymorphous. This is the crystalline form, and ours the amorphous. Think of diamond graphite and carbon, chemically identical, yet how different in their behavior because of the physico-chemical structure."

"This is good news, men. There is enough varium here to build thousands of ships. We'll have to establish the first settlements on an island near the varium block."

"How do you think we would go about colonizing?"

"We'd soak the whole island with hydrogen cyanide from gas bombs. That would exterminate any life on it. Then we could burn all that is left of the vegetation and later plough the ground and fertilize it with strong chemicals. After that, we would be ready to start planting terrestrial plants, grass, tropical plants, bread trees, bananas, cocoa, coffee, tobacco, palms, etc. Until this preliminary work is done, we could live on the ship that brought us over. A kind of Noah's ark. Don't you think we could travel from the earth to Venus even outside the periods of conjunction?"

"Yes, if we can protect ourselves from the increased sun's heat. It will take longer, of course, several months. Needless to say, it is impossible while the sun is between the earth and Venus."

"Well, let's stick to it then. Now let's think about our return trip. Do we have everything that we want to take along?"

"Everything," confirmed Taussig. "Food supplies for weeks, including fresh meats. It is between the windows. It will freeze stiff once we get out into space. The water tanks are filled and the air supply is all right."

"How do we want to start now?"

"I think it best for us to remain here till fifteen minutes before starting time. Then we will proceed north for the remaining twenty miles, go down on the ocean for a minute and then start on a positive charge, headed for Mother Earth.

CHAPTER XXII

Prisoners

● One would be altogether mistaken in thinking that this world of ours is known and explored through all its parts. What seaman, for instance, could truly say that he knew the Pacific Ocean? Of course, the common steamer routes are known to all of them. But hardly anyone ever ventures into the immense spaces north of the Wellington-P. Arenas-Rio de Janeiro.

That is where the greatest depths have been measured, and where the fathom line was lowered six miles without touching bottom. There are square miles of seaweed of unknown origin, entangling propellers and hindering the boats. It is the home of ill-reputed eruptive formations and cliffs that are avoided sealously by steamers. Coral islands, upon which no man has ever set foot because no steamer would venture into the death traps of furious breakers dashing upon them, barricaded waters in which there probably are undiscovered islands. No one knows whether their age is measured in years, centuries, or millennia. The sea charts indicate only the ordinary warning signs and the blue color of water.

Over the western edge of this vast waste, the turbine boat, Melville, was pursuing its course from Auckland to Apia. Miss Mary Rowland, daughter of the famous Chicago Shoe Polish magnate, was lolling on the promenade deck, trying to amuse herself with her companion, Captain Snodgrass. It must be mentioned here that during the war, Snodgrass had lost two ships at the hands of German submarines. For this reason, the old Captain had confined all his conversation to just one subject: the damned huns.

"You see, Miss Rowland, this route used to be served by a German company, too. We could do nothing about it then, because Samoa belonged to the Germans. Nobody could compete with the huns for speed, nor against the reasonable rates and the luxury they offered. Good old England has put a stop to it all right. I don't think that I'll ever see again a flag with the German cross, in these waters."

Miss Rowland smiled indulgently, but with a trace of sarcasm, "So you started the war to do away with a few German steamship lines whose competition you couldn't cope with effectively. Could you not have done that in a more business-like and humane way?"

"We didn't start the war. Kaiser Wilhelm was———."

Miss Rowland laid her hand gently on Snodgrass' arm. "Let's not go into that now. I am too well informed to swallow all that old rubbish. Look, what is that over there on the water?"

She pointed to a long object 1,500 feet away from the steamer. The old sea dog whistled through his teeth, "Hm-m, it looks like a hun invention."

"But the war is over."

"You can never tell about those damned huns."

The captain whistled a signal. A squad of sailors got a boat ready.

"What are you going to do?" asked Miss Rowland.

"I'll take a look at that thing."

The power was off. The ship glided toward the strange object. Meanwhile the boat was lowered with a crew of eight and an officer. The boat swiftly covered the distance to the object in question. The passengers followed every move of the crew. Through their field glasses they could see only a ship's body. It seemed to be half

submerged in the water with a hump-like superstructure protruding above it.

The boat had been out for an hour. The passengers exchanged assumptions about the nature of their findings. Walking the deck restlessly, Snodgrass was figuring out the loss of time and money caused by the delay, in loud soliloquies.

Presently, the boat returned to the steamer, towing the strange object. Now the passengers could see that the boat had several bodies and a big, black dog on board. The boat drew alongside the steamer and was then hoisted aboard. The dog leaped onto the deck with flashing eyes and a hanging tongue.

The sailors carried four men, seemingly lifeless, from the boat. They laid them on stretchers and covered them from head to heel with blankets, carrying them then into the cabin.

Others of the crew hoisted the object of their excitement on board. It was a completely sealed vessel with a pointed nose and a two blade propeller.

Trembling shook the body of the steamer. She got under way, proceeding under full power.

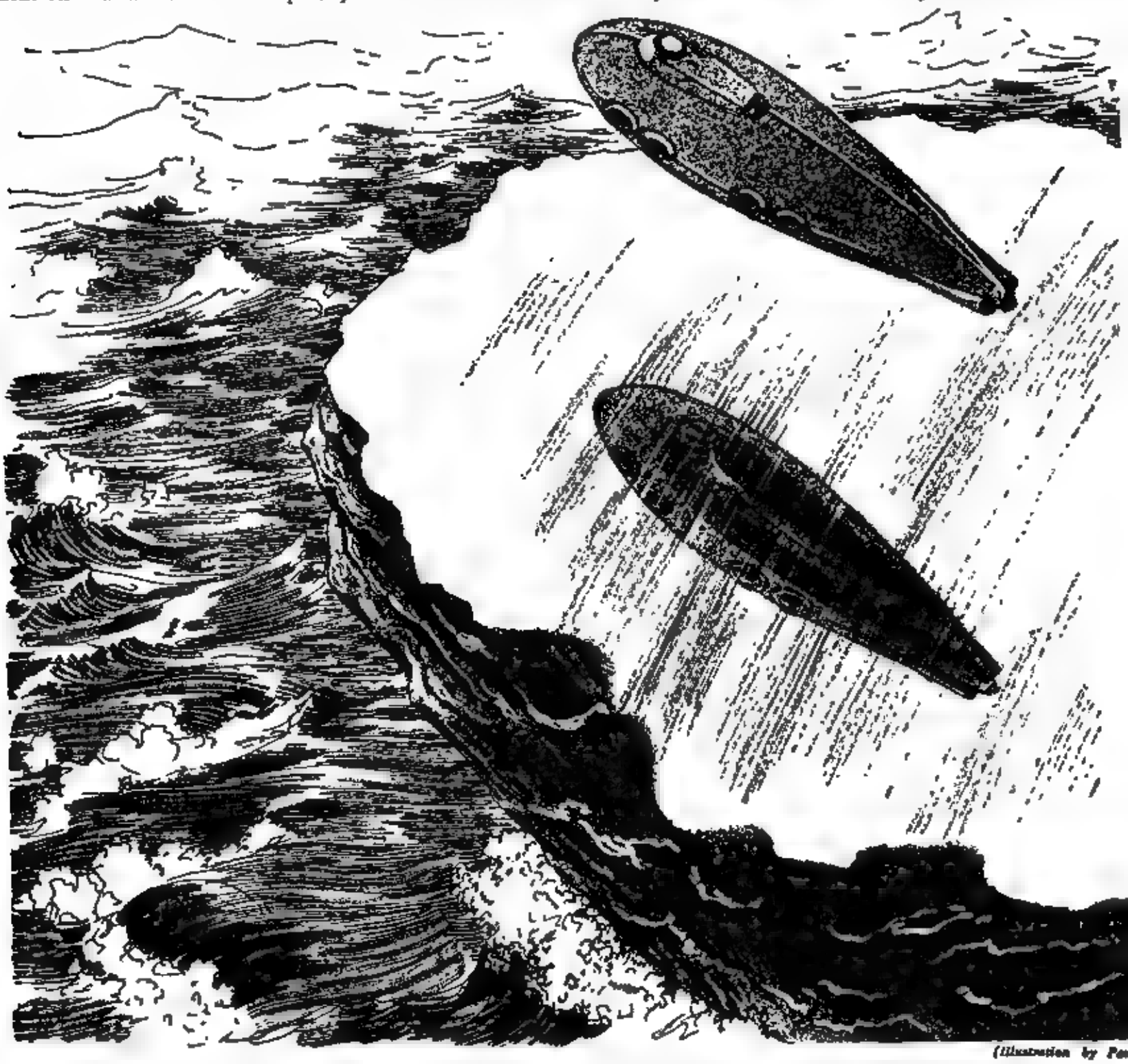
The rescued lay on their stretchers, the ship's surgeon bent over one after making the rounds to all of them. "These people are very fast asleep. Get a warm bath ready, strong, black coffee, and then a good, hearty breakfast."

One of the sleeping men was undressed, placed in a hot bath and rubbed with wet towels, but the treatment produced no results. A cold shower brought life back to the sleeper. Opening his eyes, he shouted angrily in German, "What the devil! Get away from me, will you? What a damned nuisance!"

The doctor bit his lip, and ordered, "Dry him; give him fresh underwear and bring on the next one."

● The captain entered and took the surgeon aside.

"Do you know what kind of ship theirs is? Thornton



(Illustration by Paul)

It was a huge block of pure crystal ten miles in circumference. In the center the Astraea mirrored itself clearly.

tells me it is a gunboat with lots of strange things inside. He was all upset. What nationality are these people?"

"German, no doubt. A man coming out of anesthesia will always speak first in his mother tongue."

"Huns then, eh? I thought so. And a submarine. They are supposed to turn them all over. Well, we'll confiscate this one and take it, with its occupants, to the next port."

"I am not so sure that they are Germans politically. I was in the war in Flanders and met plenty of doughboys who spoke German."

"How would an American submarine get into these waters?"

"More likely than a German one. Before long, Uncle Sam and the Japs will come to blows. It is most likely an American boat, and since it has a crew of only four officers, it is doubtless on a tryout."

Snodgrass scratched his ear. "Sounds plausible, what you are saying. I'll treat them like gentlemen, then. But I'll take a look at the boat, and before we get to Frisco, I'll know its secret. If we meet an English battleship, I'll turn it over to them. And if they are huns as I still suspect, I'll keep them prisoners in chains."

"How are you going to find out?"

"If they are American naval officers, they will have to be able to identify themselves as such. Give them something to eat now, Doc. I'll be back shortly."

An hour later the four travelers sat around a table in the surgeon's cabin, freshly and completely dressed. The surgeon did all possible to make them feel at home, even trying to force them to accept every course of the meal.

"Doctor, would you tell us just where we are?"

"On a British ship."

The four exchanged glances. "Battleship?"

"No, turbine liner, *Melville*. En route from Auckland to Apia. My name is Robert Hill and I am the ship's surgeon, as you probably have guessed."

"Glad to know you, Doctor," said Taussig. "I am Captain Samuel Webster. These others are Colonel Johnson, Captain Smith, and Captain Walker. How did we get on your ship?"

"We saw your craft floating on the water, and the captain made them lower the boat and take a look at you. They had to break one of your hermetically sealed bull's eyes to get inside. I take it you are United States officers?"

"That's right, doctor."

"How did you happen to get into that strange situation?"

"That is asking me too much. We'd been on the Pacific for weeks. Maybe one of the carbon dioxide tanks burst, or something like that. At any rate, we are greatly indebted to you and don't know how to thank you. What became of our craft?"

"The captain had it hauled on board. It is undamaged except for a broken window."

"Did your people go inside?"

"Lieutenant Thornton went inside first. Then there were the two sailors who carried you and your companions outside. No one has entered it since."

Martin rose. "Do you mind if I go to have a look at the boat?"

"Not at all, I'll call the captain."

He left the room. Lindner was about to speak. "Not a single word," he said with finality. "Have you all got your varium rings? I've lost mine."

The others shook their heads. They, too, had lost their rings. "But why shouldn't I——?" Lindner began anew.

"Man alive! Don't you see? We are on an English boat. Prisoners, or just as good as prisoners."

Taussig looked about him grimly. "Just let me get back to the *Astraea* and you will see who are the prisoners around here. At any rate, make no suspicious remarks or movements before we get back on our ship."

"But the *Astraea* is lashed to the derrick."

"Just the same,—but be quiet now."

Captain Snodgrass entered, followed by the surgeon. Martin advanced toward them, his hand extended in a gesture of good will. "Sincere thanks, captain, for your intervention and your genuine British hospitality."

Snodgrass grasped the proffered hand. "The doctor tells me that you are American officers."

The four men introduced themselves. Snodgrass shook hands with all of them. He sized them up doubtfully. "Mind if I ask about the purpose of your strange craft? Naturally I am interested."

"Why, certainly. It is an experimental affair."

"Oh,—so?"

"Precisely." The "colonel" was speaking to the captain.

"How did you get into such a jam from which we rescued you?"

"I have already had to deny the doctor an answer to that question. We only know that we had been to sea for some time. We awoke aboard your ship,—in a bath tub."

"Is it not strange that a submarine should be cruising so far from any naval base?"

● Martin smiled engagingly. "Well, Captain, I can't tell you everything, of course. I am bound by certain military secrets, but I can assure you that this last trip of ours served merely a scientific purpose. I have a few things on board that you would not want to miss seeing. I will also be glad to show you our papers if you care to come along into the boat."

"Just a moment, colonel," Snodgrass said as he rubbed his hands together confusedly. "The rescue of your ship has cost us much loss of time and fuel, of course. Would you mind arranging a more agreeable indemnity payment than the usual lengthy one of official business between the two governments?"

"Let's talk that over inside our craft," suggested Martin. "You know that the salvage depends on the value of the object rescued. I would like to have your estimate. I do not intend cheating you, so I don't mind telling you that our boat cost several millions. I am also in a position to authorize a sum beyond the legal rate of salvage."

Snodgrass, who had been thus far reluctant to accompany his guests into their craft, now changed entirely. The thought of money which he gloated over, had blown to bits all his sense of caution and his suspicions. He asked the steward to bring four coats for the four officers, for the sun was setting and a stiff breeze had arisen.

When they reached the deck, the four companions unconsciously stopped for a moment. The breeze was crisp, the sky clear, and the sun about to set, bathing the ocean and the sky in flaming red.

The four men could not help feeling some emotion look-

ing at the mild and beautiful sun, the same cruel sun that had been almost their undoing out in distant space.

"Gentlemen," Snodgrass addressed them, "Here is your boat," as he led them to the railing.

There she was indeed, the good old *Astraea*, beside the towing boat. A heavy rope tied her to the steamer. The right hand window of the platform was broken through.

Martin was the first to enter the boat. He opened the platform to admit the others into the interior, which they found to be completely intact.

Taussig went immediately to the static generator and started it. He then took his seat at the wheel, placing his hands on it. Martin handed the ship's papers to Snodgrass, but he scarcely gave them any attention. He looked at the skeleton of the Venusian man. "What in heaven's name is that?"

Without answering his question, Lindner opened his cabinet containing all his preparations. Bright light emanated from it. He took out a sealed tube and closed the cabinet again.

The tube threw out a light like an 80-watt bulb. Snodgrass took in everything with astonishment. "What sort of light is that? Aren't you afraid of burning your fingers?"

"No, it is quite cold."

The Englishman hesitantly took the tube into his hand, then returned it, shaking his head perplexedly.

"Now," said Martin, "we will show you the other rooms of our boat."

Led by Lindner, the little party toured the ship, Snodgrass evidencing utmost amazement over the many curious objects and scientific specimens that he was shown.

"Where did you get all this stuff?" he asked. "I have never seen anything like it, yet I have been all over the world."

"They are very valuable scientific specimens," replied Martin. "It would take too much of your time for us to explain them to you coherently. But we will soon publish a paper on our expedition and shall be pleased to let you have the first copy of it."

"Any way in which I can repay you for such a favor?" inquired the Englishman politely.

"Yes, let us have all the recent newspapers that you can find on board. We shall remain here, of course."

"Right away," responded Snodgrass with alacrity as he proceeded to the platform. He hailed one of the deck hands. Then, Bello made a leap onto the platform, rushing joyously straight to Martin.

"How did the dog get on your ship?" asked Martin, patting his faithful companion.

"It was he that called my boys' attention to the presence of human beings in your sealed boat. Otherwise, they would merely have towed the craft alongside without bothering to get into it.—Here are your papers."

In the meantime, the lights of the steamer were lit, illuminating everything with the brightness of daylight. Lindner smiled. The platform closed. With his hands he fastened two heavy iron bars across the exits of the platform. All the lights aboard the *Astraea* also flashed on.

The company returned to the middle chamber where Taussig was still seated at the controls, motionless as a statue. Lindner went to the gun chamber from which he returned in a minute. He put iron grids into each of the side windows.

"What are you doing there?" Snodgrass asked, following closely Lindner's movements.

"Just making sure against trespassers. We have some high voltage going through those grids, fatal to anyone who touches them. Don't you wish to continue your inspection of our boat?"

● Disregarding the last remark, Snodgrass asked with quivering lips, "I am your prisoner then?"

"Oh no," smiled Martin, "as much our guest as we were yours."

"Well, what is your estimate of the salvage?"

Snodgrass calculated and mumbled for awhile like a tradesman preparing a customer for an especially shameless price, and finally asked a round million.

Martin guffawed with laughter. "What do you think of that?" He turned to his companions

"I suggest," offered Lindner, "that we simply give the captain a writ, certifying his claim as legal for salvage which he may collect through the ordinary routine."

"You are forgetting that I saved your lives."

"Ridiculous. If you had left us alone and allowed us to wake up by ourselves, it would have been just as well and our window would not be broken."

"You will come along to San Francisco anyway, where I shall turn your craft over to the port authorities."

"That's out," interposed Martin, "Exorbitant as your demand may be, I'll pay you. But then we will leave your ship right away." Saying this, he sat down about to write a check.

"Oh no," said Snodgrass stubbornly, "your boat will remain on board until we reach San Francisco."

Martin rose. "You really think that I, the commander of this war vessel, am going to take that talk from you."

Snodgrass shrugged his shoulders. "Do something about it if you can."

"I certainly will."

"Let me have the check."

"First, take the rope off our boat. Come up on the platform."

"I'll go there with you, but the rope will stay as it is."

"Captain Snodgrass, this is final. If you take off the cable, this check for a million is yours."

"Nothing doing."

"Now I'll tell you something. We are not Americans. We are Germans." He tore the check into bits.

"I knew it," shouted Snodgrass, "huns, a bunch of damned huns."

"Another remark out of you and I'll crack your skull. Come to the platform where you will ask me for permission to untie the rope."

All rushed to the platform except Taussig. The steamer commenced rocking more and more. "Do you get it?" said Lindner to Meixner. "Taussig is alternately charging positive and negative. Now the *Astraea* has several times its own weight, and a moment later, lifting power."

The platform was opened. The bewildered screams of the passengers were heard as they were terrified by this strange rocking of the giant liner.

"You see how the water is rising more and more? Another five minutes of this rocking——."

"And we'll all go to hell," viciously snorted Snodgrass.

"Not we, dear sir," laughed Lindner, dragging behind

him a hose with a nozzle. "With this flame thrower, I can sever that rope in two seconds and nothing will happen to us. But your ship will sink."

"Why don't you do it now?" urged Meixner.

"No," insisted Martin, "the Britisher must ask for mercy."

"Dirty dog of a hun," Snodgrass snarled cursingly between his teeth. Martin dove toward him with a raised arm. Meixner threw himself between the two belligerents.

"Are you mad, Captain Snodgrass? Think of your passengers, the women and children. Do you want to sacrifice their lives to your British thick headedness?"

Snodgrass began to realize a few things. "You're right. What a disgrace to ask a hun for mercy!"

The waterline was still rising.

"I give in," Snodgrass finally groaned.

"Stop," Martin shouted into the engine room. "Don't bother taking off the rope; we'll do that ourselves." Two flames spouted from the nozzles and the ropes on both sides were severed from the body of the *Astraea*. The rocking of the steamer subsided.

"Now, farewell to you," said Martin.

Without a word of reply, the captain hastened up the rope ladder, to burst into a flood of curses when he reached the deck.

"Go!" Martin commanded tersely.

The *Astraea* rose a short distance and then remained suspended in the air. The *Melville* glided away below her. For another moment the excited crew looked at the *Astraea* floating like a meteor. Then the lights faded away like the memory of a weird nightmare upon awakening.

CHAPTER XXIII

Onward to Venus

● Taussig had extinguished the lights. At moderate speed the *Astraea* headed east.

"Why did you darken the lights?" inquired Martin.

"It is none of the Englishmen's business what course we are taking. Everything seems to be all right again. We are rid of the British, free from the monsters of Venus, unhurt by the horrors of space, the stifling sun, the icy cold, and the inadequate breathing and the terrible weightlessness."

"Thank God," added Lindner, "we are back on earth."

"And in safety, too," appended Martin. "Now let's systematize our memories somewhat. How did we get into that tight jam in the first place?"

"The return trip was much more terrible than the going," mused Lindner. "The terrible sun's rays beating down on us all the time. Didn't we get into a galaxy of meteorites coming back? Remember how one big chunk hit the shell of the ship near the pig pen? We wouldn't have dared to open the door again for fear of letting our breathing air escape."

"That's right. I remember now. We'll have to put independent barometers into each cell."

"What happened then?" asked Taussig. "I got it. I was figuring on the platform for hours until I finally found that we had to switch to positive at 35,000 miles off the earth."

"That's true," Lindner said, "Remember how Taussig said, 'Take a look at the sun below you; it will soon rise and stand above us. We are going back to Mother Earth now'."

"That's as far back as I can remember. The next thing I knew of was a cold shower on board the English ship. Br-r."

Meixner now joined the discussion. "I remember a little more than that. Taussig asked me to crank the motor which had stopped. He could not change the charge without the static generator going. I did my best but could not get the thing started. That is all I can remember."

"It couldn't really go. There was no gravitation, which is essential to the motor's operation. We should have had a storage battery to drive the generator through the zone of absent gravity. Upon entering the gravity zone of the earth at forty miles per second, I was to charge positive so our speed would be gradually diminished on nearing the earth. But I couldn't do it."

"Why not?"

"For some reason or other. I remember how Meixner took a desperate hold on the chair with his legs and one hand. I had my hands at the wheel and was about to turn it to the left. Then everything began to swim before my eyes and I dropped unconscious. My last thought was that the *Astraea* would now hit the earth at a speed of 80 miles a minute. That the friction didn't cause it to be ignited and burned to fine dust, will forever be beyond me. And then, the enormous pressure when it hit the water. The *Astraea* must have gone miles below the surface because of its terrific speed before it came to rest and then began to go upward again. A wonder that our ship could stand all that."

"How is it that we don't remember anything about it?"

"Meniere's disease," explained Martin. "The same thing that afflicted us on our going trip. The disease of weightlessness. The symptoms are disturbances of the labyrinth, unconsciousness, etc."

Martin interrupted the conversation by going to one of the windows. "If you rise a little, we'll see the moon rise. The entire northern horizon is red as from the glow of a big fire."

The ship rose to 1,500 feet. Only the sky and the ocean could be seen. The moon stood on the outermost edge of the boundless sea, a giant red ball.

"Who wants to relieve me at the wheel?" begged Taussig.

"Why? Do you want to sleep?"

"No, I have slept enough, but I want to read the papers. If we go on at this speed, we'll be in the unexplored regions of the South Seas at sunrise. I would like to see that before we return to our island."

Meixner offered his services. The others were absorbed in reading the Australian and New Zealand papers that the English captain had given them.

Unbroken silence reigned for a time.

Martin broke it. "Did you read this report of the earthquake on one of the Sunday Islands? Must have been awful. In the middle of the night, and without any warning. Say Taussig, what are you figuring again?"

Taussig dropped his pencil. "Strange, indeed. You know, the earthquake on Venus that almost cost us our lives, well, it occurred at the same time as this one in the Dutch Indies. And here is the comment of an English astronomer, who says that the disturbance can be attributed to an unusually large sun spot. The simultaneous

reaction of the two planets certainly substantiates his hypothesis. There must be interplanetary relations between the heavenly bodies of which we have no notion at all."

● On the next morning, they were over the cliff regions of the Pacific upon which no man had yet set foot. For miles around there were the treacherous breakers. The cliffs were so close together in places that not even a rowboat could have gotten through.

The travelers devoted more than four hours to an inspection of the ill-reputed territory, but there was nothing to discover except barren and threatening cliffs. They were just about to give up, when they noticed in the distance a large territory of the same formation on the edges, but with green spaces in the center. They veered their course toward it and discovered that it was a group of islands, five of them. They slowly descended to the largest of them in the center and waited for its inhabitants to come forth into view.

But not a trace of human activity. There were no huts, no fires nor any remains of any, no footprints nor any suggestion of tilled ground. They went on. Palm forests, a high mountain with tropical vegetation, an active volcano with basalt walls, and a steaming sulphur spring, then more woodland as far as the eye could see.

The island had an area of at least twenty square miles. They landed on a clearing in the forest, where they noticed a group of animals grazing which they first thought were deer. They turned out to be kangaroos which came toward them without any show of shyness, a sign that they had never been in contact with human beings before.

The island, then, was really uninhabited.

"Come back," said Taussig, "we found out all that we wanted to know. The whole group of islands is probably uninhabited because of their inaccessibility from all sides."

The *Astraea* rose. Its occupants searched island after island, all of which had thus far been saved from human greed. Each offered enough room for fifteen to twenty thousand people.

"This is our chance to prepare for colonizing Venus on a large scale. We could accustom our people to the tropical climate and make experiments with Venusian plants in our soil, and terrestrial plants in Venus' soil. All the Venus plants and animal specimens that we brought with us could be studied here by German research men in leisure and safety, and their industrial possibilities exploited. We shall also have ample room for building as many warships and space ships as we like, once we get the varium over here from Venus."

"We might also blast an entry through the cliffs so our ships will be able to approach the islands."

"That's out," said Taussig. "We shall not transfer over here until after the first big ship is completed. So far as shipments on Martin's freighters are concerned, we shall unload them at sea. If we have enough varium, we might also build a ship camouflaged as an ordinary freighter. On arriving here, it could simply leap over the cliffs. What in the devil is that?"

They had landed on the easternmost of the islands. Contrary to all measures of caution, they had all left the ship and were walking along a little creek. Presently Taussig's dreams were cut short as he pointed to something on the ground at his feet. A footprint. All were wrought up with excitement. In the moist sand there was a distinct print of a man's left shoe. Its shape identified it as a common American-made shoe, and the print showed hobnail marks.

Taussig turned and ran back to the *Astraea* as fast as his legs would carry him. The others followed his example. Martin unleashed the dog, returning with him and Lindner to the scene of the suspicious footprint. Taussig remained on the platform with his gun in readiness, while Meixner took his place between the ship and the explorers as a sort of contact between the two.

A close examination of the print revealed a feeble impression of the right foot. Bello, the dog, took up the scent and led the party over a zig-zag path through the woods. After awhile he stopped and began to bark. Lindner stooped and picked up a man's wrist watch which was still running. He put it into his pocket and took up the trail, which curiously enough, landed him back at the *Astraea*.

They returned to the creek, crossed it and urged Bello again to pick out the trail. They searched both banks in two directions until boggy swamplands prevented their going farther.

They returned to the *Astraea* and made a minute examination of the watch. It differed from the time of the island about eight hours, and had been wound only four or five hours before. The inside of the case indicated in the back the trademark of a well-known Swiss watch factory. It offered no clue as to the nationality of its owner. Its time may have been that of Hongkong or western Australia. Only one thing was sure; a stranger, a man, had been on this island from one to four hours ago, an island, to be sure, upon which no other man ever set foot.

"How could he have gotten here? By ship? Impossible. For miles on all sides, forbidding cliffs discouraged any of man's feeble advances. He could only have gotten here by air. Only a ship could have brought him, with the airplane, to these islands, because there were no taking-off places within a flying distance of this place. In that case, the carrier ship could not be far away."

● After they had come to this conclusion, they went up, and in ever widening circles, they searched the whole territory at an altitude ranging between 1,500 and 3,000 feet. Although they devoted all day to this task, the ocean seemed just as deserted as were those on Venus. Nowhere could be seen a sail or a smoke curl. They finally gave up as darkness came on.

They took an east northeast course, returning to the island upon which they had first landed, to spend the night. The broken window made it impossible to go into outer space to be transported by the earth's rotation to the point of their destination.

On the morning of the second day, they had reached Central America. At 10 a. m., they were passing the Isthmus of Panama. They were all grouped in the central cabin, Martin at the controls. Rapidly they were veering to the east on their way home. They were immune to joyous anticipation of home because of the consternation they felt over being unable to solve the mystery of the footprint.

"No," said Martin, "I will not give up these islands destined for us by God just because of one solitary footprint. We'll simply arm our settlers and equip our islands with anti-aircraft guns. From the ocean, those islands are im-

pregnable. The zone of protection is at least twelve miles wide, and at some places even twenty."

"Well, there are great guns that carry farther than that."

"Yes, but there is no armor plate against our six-inch shells. A combat ship like the *Astraea* must always remain near the settlement for protection."

They meanwhile reached the neighborhood of their island. There it lay, their own creation. The rearing peak on the northern peninsula and the narrow isthmus which connected it with the settlement. "What in the world is that?" asked Martin, peering through his telescope. A flash was seen at the site of their concealed battery. A little white cloud of smoke, and now the sound of a detonation, followed by several others.

"Who is being fired upon?"

"There," said Taussing pointing east, "two cruising ships are exchanging shells with our battery. Lord, but our people are poor shots. Just missed another one. If only I were down there beside the gun. But the others aren't such good marksmen either. That makes up for it."

"Yes," said Lindner, "their shells are hitting the other side of the island. Well, those long range guns,—there is nothing quite like a solid mortar."

"I'll get in on this game," said Martin, feverish with the zest for battle as he pointed the nose downward toward the ocean.

Taussig seized his arm, "Careful that you don't get into the range of our own mortars. Their projectiles go up almost vertically and if you want to drop a bomb, there is danger of them hitting us if they aim anywhere nearly accurate enough. "What'll we do?" asked Martin undecidedly.

"Land and stop our battery before we intervene."

"Suppose a shell from one of the battleships hits us as we descend?"

"Well, those are the chances we have to take. But they are much less dangerous than our own battery."

"If the enemy sights us on rising again?"

"Let them," said Taussig with glowering expression. "As long as I am at the controls, they'll never have a chance to tell about seeing us."

Just as the *Astraea* was making fast to the old landing place, a shell hit fifty paces away, tearing a deep crater. They paid no attention. Taussig slid down the rope ladder in feverish haste and bound in long strides to the slope topped by a battery. The *Astraea* had risen the same moment he had left it. He was just in time to stop one of the gunners from firing the upturned mortar.

Surprised, the men stared at him and burst simultaneously into one deep-throated "Hurrah!" He was confronted with a volley of questions, for their curiosity at his sudden appearance was uncontainable. Taussig raised his arm. "Just a moment. Where is the airship?" A chorus of voices answered that Rhaden and three companions had left on it four days ago and were expected back today or tomorrow. This was the third journey of Rhaden's and they had no doubts about his punctuality.

"What are those ships out there?"

A crash, as if the earth were bursting, a trembling and swaying of the ground, flying sand and splinters of stone coming from the explosion of a shell which had struck before the battery. "They are aiming a little better now," Taussig commented, "but it doesn't mean anything to old artillerists like us. Nothing compared with the days in Flanders' fields, where we had no other cover than shell holes. Martin will put a stop to this business in a hurry."

He grabbed the binoculars beside the gun and climbed up the ladder to the edge of the entrenchment. "There, the *Astraea* is already over one of the ships. They are still unaware of its presence, and are shelling us with all guns. I hope they won't do any—atta boy, Martin, that's giving it to them!"

● A loud detonation from the ocean accompanied his words. "Boiler explosion," diagnosed Taussig. "That fixes them all right. Now for the other one. Ah—they have stopped their shell-fire and are lowering boats to rescue some of their drowning comrades. "Too late, too late, gentlemen—superb, Martin—there goes the second ship with a part of its stern blown away. Watch the pier. Load two guns with shells and aim.—All right, we can come out from under cover now."

After a moment Taussig continued, "What is that now? Looks like the *Astraea* at the landing. That must be impossible."

He went over to the landed ship, followed by his inquisitive companions. Beside him, a rope ladder dropped from the platform and a man emerged from the ship. "Why, Rhaden!"

"Taussig!"

The two men shook hands. "Where do you come from?" asked Rhaden.

"From up there," answered Taussig, pointing to the sun, "And you?"

"We were on expeditions, too," said Rhaden in a tone of importance. "Where are the others?"

Taussig pointed up where the *Astraea* was just descending beside the other ship. "What kind of battleships were those?" asked Rhaden.

"Englishmen!" somebody answered. "In the morning, an officer and six sailors came over, asking for some drinking water. We gave it to them by throwing them a hose from our water tank, but refused to let them land. Then they departed and for two hours now they have been firing on us."

Now the entire population of the island congregated on the landing place, shouting "Hurrah" and rejoicing. Emily, at the head of the group, was searching for Lindner with tears in her eyes.

Martin and Meixner joined Taussig and Rhaden. "Rhaden, where have you been?"

"I? Well at least not on Venus. But I, too, have found some land perfectly ideal for our purposes."

Taussig smiled slyly, "Can you tell me what time it is, Rhaden?"

Rhaden glanced at his raised arm, then answered, "Sorry, but I seem to have lost my watch."

Martin produced the wrist watch which he had found on the island, "Is it this one perhaps?"

"Damned if it isn't. How did you ever get it?"

* * * * *

This, therefore, was the detailed report of Lindner, left with his wife's uncle. The last sheet contained only data and very brief notes. It might have been that he did not find the time to present the material in a more detailed form. In the following, I am giving his notes in the order

(Concluded on page 188)

(Illustration by Paul)

The surviving Batrachs fought with each other to escape through the narrow doorway. A bellow of rage came from Angus as the men rushed forward.

EXILES ON ASPERUS

By JOHN BEYNON HARRIS

● This story is an unusual interplanetary tale. But it is even more unusual for the insight of the author into the possibilities of other races, alien to humanity developing in the universe.

Humanity, as our author shows, developed upon the earth because of its wonderful adabtibility. We can stand, relative to other terrestrial animals, great extremes of hot and cold; thirst and hunger, privation and disease. Therefore we conquered the planet.

But there might come a time when our adaptibility might be a disadvantage; and when creatures less adaptable and more fixed in purpose could overrun and even enslave us. How that could be done, in an unknown part of the solar system our author shows in this intensely exciting story.

Foreword

● Whatever our private opinions—and they may differ a great deal—of the administration of Earth's colonies in the Solar System, we are, nevertheless, proud of their existence. Not only do we admire the men who founded them, but we are even prouder of the endurance of danger, hardship and discomfort by those who developed them. Few of us would care to spend even a week at a trading station upon Venus, yet many a man has worked for years in that eternal blanket of steamy mist, helping to increase Earth's comfort and wealth.

Not many of us would endure without protest a term of scorching by day and freezing by night upon the desert plains of Mars—that greatest of our colonies, so woefully mismanaged until the revolt of 2077, as to be like a stinging slap in the face of Justice. And still greater would be our trials if we should be forced to fight against the gravitation of the major planets.

Earth has cause, indeed, to be proud of all her colonies—all, that is, save one. The name of this one colony will be found in no directory; it is officially unrecognized. It is severed and will remain severed, probably forever, from its parent world. Its men hold no communication with us, and it is long since we have heard how they fared. A conspiracy of silence has closed down on its unfortunate existence, and one of our earliest—though involuntary—settlements is unknown to most Earthmen even by name. Its story is unique.

CHAPTER 1

Misadventure

● A violent shock threw the navigator of the *Argenta* forward in his chair so that he sprawled across his control desk. His two companions in the navigating dome staggered and slid across the deck plates. The clangor of a dozen or more alarm bells jangled throughout the ship. Angus McDowell, the chief engineer, made his way back to the desk, ruefully rubbing that part of his head which had met the wall.

"What the hell—?" he began in a mildly surprised tone. The third man, Joe Seely, scrambling from the floor, cut him short.

"Holed, sure as we're living," he exclaimed. "These ruddy asteroids!—where's the damage, David?"

The navigator turned to look up at the rows of indicators mounted to the left of his desk. In the middle of the top row a red light was winking briskly.

"Guard room," he reported.

"Hell!" Joe, who was officer of the watch, tore out of the navigating dome and they could hear his voice bellowing orders down the corridor as he ran. Angus strolled closer to the desk. His was a lanky, angular figure possessed of long arms and big joints. He showed no smoothly rounded muscular development, but those who had once tried conclusions with his tough, sinewy frame seldom wished for more. A long faced Scotchman, this, who had never known Scotland. The product of ancestors bred in the shipyards of the Clyde; inheriting their engineering tradition with their blood. His manner towards the navigator was slightly paternal.

"Serious, Sonny?" he asked.

David shrugged his shoulders. A few years in the service had already given him a degree of that fatalism characteristic of so many space sailors.

"Final for those who happened to be in the guard room. That indicator means that they hadn't a chance to plug the leak. All their air was gone in two seconds. For the ship as a whole, not very serious."

Angus nodded relievedly. "Surprising it wasn't my engines. We do have a bit of luck—sometimes." He paused before he added: "Think I'll cut along and have a look at the mess."

Angus clattered across the room, bending his head as he passed through the low exit. David returned to his calculations and corrections. No one was to blame for the accident. Approaching the asteroid belt, above the plane of the ecliptic, one could do no more than plot a course avoiding the larger, known fragments of rock, and trust to luck for the rest. Luck, on this occasion, had been less unkind than she frequently was.

Angus, making his way forward, toward the guard room, found a knot of men crowded around the entrance. Above the door, now automatically sealed by air pressure,

a red danger light glowed steadily. Joe Seely was, with some difficulty, climbing into a space suit and attempting to bawl his orders above the continued clamor of the alarms. As the bells abruptly ceased Angus heard him say:

"Six men to bring the portable airlock. Snap to it."

● The six raced off down the passageway while he still struggled with the intractable garment. When, at last, the stiff folds had been tugged up and the fasteners securely fixed, he picked up the air tanks and examined the dials. He dropped them disgustedly.

"Half pressure—criminal carelessness. Somebody's in for it over this. You!" he roared, startling a near member of the crew, "new oxygen pack. Jump to it!"

He lifted the space helmet and, turning it over between his hands, examined it with caution.

"Hm. Appears to be satisfactory," he admitted grudgingly.

Angus with a grin placed his big hand on the other's shoulder.

"Now, don't you get rattled, laddie," he advised. "Gettin' rattled never did a man any good. He forgets details if he gets all het up—and you only forget details once in space."

For a moment Joe seemed inclined to resent the warning. Then he smiled back and nodded. Angus was an oldtimer and privileged. Besides, he had spoken the truth: Joe had been getting windy.

The party returned bearing the portable airlock. It was in the form of a hollow box built of steelium sheets, but it lacked one of the longer sides. Around the six feet by four of this missing part, it was heavily faced with rubber. In the side opposite the space was set a door. The men fitted the contrivance over the guard room door so that side flanges slid over bolts provided for the purpose. While they worked hard with spanners to secure it, another of the crew attached the pipe which would later exhaust the air. Joe watched fidgeting impatiently until the spanners were laid aside.

"Finished?"

"All correct, sir," the leader assured him.

"Good. Give me a hand with this helmet."

Half a minute later he was inside the lock. He made sure that all was in order and the door safely bolted behind him and gave the starting signal of three taps on the metal wall. The pointer before him began to back swiftly as the pump did its work. In a short time the pressure became low enough for him to open the guard room door and, with a rush, the remaining air dissipated into the vacuum.

Joe moved clumsily over the threshold and surveyed the room. It was not a pleasant sight. It was, in fact, far worse than he had expected. For one thing there had evidently been far more men in the room than was usual at any one time. Their lifeless bodies seemed everywhere. Sagging in their chairs, fallen forward across the tables or sprawled on the floor wherever the sudden going of the air had left them. Their faces were a grey-blue and their mouths lolled open to show grey tongues.

Their fingers were tight clenched as though in a last, despairing clutch at receding life, and their eyes, fantastically protruding, seemed still to stare at death. The eyes of some had left their sockets. From the noses and ears of many, little streams of blood had spurted to be frozen by the cold of space. Joe felt sick. It was not the first time he had seen men dead from exposure to the vacuum, but it was the first time he had seen them in such numbers.

He counted more than thirty—almost the entire corps of guards snuffed out in a single moment. For what purpose they had all been assembled at once, he could not guess. He pulled himself together and brought his mind back to the practical aspect of the situation.

"It'll be tough work looking after the prisoners now," he muttered.

He looked along the room and saw on the port side the three-foot hole which had caused the tragedy. Beyond, he could look out into space—a velvet blackness, pricked by distant stars. He turned to starboard in search of the corresponding hole and saw with a shock that there was none. He had never heard of a meteorite failing to pass clean through any ship it had struck. It became plain that here was a chance in several million. The object must have been moving at a speed but little different from their own. Its force at the angle of impact had only, therefore, been sufficient to carry it through one side of the *Argenta*. A short search for the cause of the mischief revealed it lying beside one of the corpses at the foot of a stanchion. The stanchion, massive member though it was, had been badly bent by the encounter. Joe whistled softly in surprise as he looked down. Instead of the irregular lump of cosmic rubbish he expected, he found himself gazing at a dented, steelium cylinder.

"A message rocket," he muttered. "Now what the—?"

Bending down, he rolled it over and felt for the catch which would slide the message compartment cover aside. He found it and gave the necessary combined pressure and twist. The lid snapped back to reveal only a single sheet of paper which he snatched up hurriedly and stuffed into a pocket of his space-suit.

After a few more minutes of cursory examination of the room, he crossed to the wall and lifted down one of the emergency plates which must be carried in all rooms and cabins. Leaving this handy, he returned to the doorway and gave the signal taps for the admission of air. Then he hurried back to the plate and held it over the hole waiting for the air pressure to lock it into position with a weight of fifteen pounds to the square inch. It could not keep out the cold of space for the vacuum in that section of the double hull had been destroyed, but it would keep in the air and artificial warmth could be supplied for the time taken in repairs.

Some little time passed without result. Evidently there had been a hitch somewhere and again Joe began to grumble over the inefficiency of the *Argenta's* crew as he waited for the valve to open. At last, however, the needle of the wall dial flickered and began slowly to turn. Soon it became unnecessary for him to hold the emergency plate. He turned off his air supply and removed his helmet as the pointer neared the fifteen mark. Then he strode over to the door of the lock. He began to speak angrily as he opened it, but the words died as he stared at a pistol ominously facing him.

"Both hands up, please," said a voice quietly.

His helmet fell with a crash as his hands rose.

CHAPTER II

Revolt

● Joe emerged from the lock and looked wonderingly around the semi-circle of facing men. They were short, large-chested men with brown faces and hands. The meaning of the situation struck him with an unpleasant jolt.

"The Martians—the prisoners," he exclaimed.

Thus did the widespread Martian revolt of 2077 affect even the *Argenta*, far out in space.

The man who held the pistol answered Joe.

"The Martians, yes, but it is you Earthmen who are the prisoners now." His speech was both good and fluent though, like that of most of his race, he retained the characteristic lilt.

Joe could see Angus at the rear of the group, towering over his lesser captors. The Scotchman was manifesting no little irritation:

"—lot of lousy sons of misbegotten desert rats. You'll see what you'll get for this, you—ugh." The speech ended in a grunt as a pistol jabbed uncomfortably in his ribs. Joe turned back to his captor.

"This is piracy. You know the penalty?"

The Martian smiled. "This is more than mere piracy—it is revolution. Everywhere the Martians are turning upon their oppressors. You thought that we were crushed. You thought that you had stamped out the last spark of our spirit when at length you caught Sen-Su and condemned him and us to exile. That was a foolish thing to do. Our plans were already made. By the arrest of Sen-Su you gained us more support and lit the fuse of the revolution. Every loyal Martian knew the date and the time."

As he finished, another group approached down the corridor. Joe could see that it comprised most of the ship's officers including David Robbins, the navigator. One, however, he missed.

"Where is Captain Briscoe?"

"Unfortunately, he is dead," admitted the Martian."

"If you killed him, you swine—" began Angus.

The other shook his head.

"We did not. He succeeded in killing two of us, but when he saw that we had really got the situation in hand, he shot himself. It was a great pity. There would have been no dishonor for him in surrender."

Joe believed him. He knew the old captain for a man of dogged pride; incapable of surrender while the means of death remained.

"And what's to be done with us?" he asked, hoping his uneasiness was not audible in his voice.

"For the present you will be confined in the officers' mess. Your crew is now occupying our cells."

By this time the two groups had joined and were moving on together. At the door of the mess room they halted. Each of the seven officers was first searched for concealed weapons and then passed in. Finally the door was closed and bolted upon a very dejected group of men. Only Angus retained the spirit to express his opinion of the situation: it appeared to amount to a withering blast of non-repetitive profanity.

"All right, all right," counselled Joe after a while. At another time he might have admired Angus' linguistic attainments, but at present they seemed unhelpful. "Just forget the Martians' ancestors for a bit—they're dead, anyway. The trouble now is, what are we going to do? We can't sit down under this."

"Do? What the hell can we do? I don't mind telling you it's the last time I ship on a ruddy convict carrier. What sort of filthy mess are they making of my engines, I wonder? A lot of stinking, bladder-chested—"

"Oh, cut it out. Have we got any weapons?"

David jerked open a drawer which he remembered to have contained a pair of pistols. It was empty. A search of the room soon revealed that the Martians had been over it in anticipation of their hopes.

"Hm, they're no fools." Joe noticed the door at the other end of the room. "Try that door, David."

David walked across and rattled the handle vainly. He shook his head.

"They seem to have caught us properly," he admitted. "What puzzles me is how they worked it. They can't have known that we were going to be holed."

"No. That must have been just luck," Joe agreed. "Judging from what the man with the gun said, it was all pre-arranged. The guards being wiped out meant that they caught us sitting instead of having to fight. But I'd like to know just how they got out."

As he spoke, he had been unfastening the space-suit which still encumbered him. He struggled awkwardly out of it and threw it into a corner. Torrence, the first officer, had made no comment since the calamity. Now he began to speak. Since the death of the captain, he became senior officer and, therefore, in command; none of those present had seemed to appreciate this, and his tone showed his resentment. He was unfortunate in that a peremptory knocking at the door cut him short halfway through the first sentence. All the men turned surprisedly. This seemed an unusual courtesy to prisoners.

"Unbolt this door at once," demanded a Martian voice while its owner rattled the handle.

David was about to call out that it was already unbolted, but, at a sign from Angus, he stopped. The Scotchman rose swiftly from his chair and lifted it above his head. He crossed the room and posted himself behind the door.

"It's not bolted," he called.

He braced himself, ready to crash the chair upon the head of the first comer. The rest prepared to spring for the fallen man's weapon and charge the door.

Disconcertingly, a voice addressed them from behind.

"Ah," it said, "a little reception committee. I thought there might be, so I took the precaution of entering by the other door."

They all whipped round to face a Martian who was accompanied by armed guards. Angus shamefacedly lowered his chair. The newcomer was short, even for his race, but his proportions were excellent, and in his carriage was a dignity utterly different from the frequent pomposity of small men. A slight smile crossed his clean-cut face at the sight of their surprise.

"A little ruse of mine," he explained.

"Who are you, and what do you want?" Torrence demanded curtly.

"My name, probably familiar to you, is Sen-Su. Till lately I was one of your prisoners."

"The Martian nationalist?"

"Yes, and no doubt you have all heard many unpleasant things about me—probably are wondering what particular form of torment I have in store for you. They have made

quite a bogey of me on Earth; I assure you they exaggerate. It has been a Governmental policy to malign me—Governments have to create thorough-going villains. In private life we should call them liars, but in public life they are propagandists."

"Well?" Torrence attempted to make it clear from his tone that he was prepared to waste very little breath and time with a man of an inferior race.

"I have come primarily to express my regret at the death of Captain Briscoe. I assure you I regard it as a serious stain on an otherwise successful coup."

There was no immediate reply from the Earthmen. They had not been taught to believe that Martians held to such a standard of behavior. In fact, it was frequently stated that no Martian knew the meaning of the word "honor." David studied the little brown man and saw sincerity in his eyes. There was no mistaking the real thing. Moreover, many times in the past he had doubted that the Martians were such scum as Earth, in general, credited them with being. He looked around at his silent comrades and took it upon himself to reply.

"We thank you for that," he said.

Angus, after a puzzled stare leaned over towards him.

"I believe you're right, Sonny," he confided in a hoarse whisper. "He means it."

Torrence cut in with a sharp demand to know Sen-Su's intentions. The other raised his eyebrows at the tone, but his voice remained even as he answered:

"That is simple. Our parts are reversed. For you, the fate which was to be ours: for us, the occupations which were yours."

"You intend to maroon us on the planetoid, Asperus?"

As Sen-Su nodded Torrence broke out wrathfully:

"You won't get away with that. All the ships in the Solar system will be at your heels. Far better surrender quietly now."

● Sen-Su smiled again, tolerantly.

"I see you do not yet understand. This is no isolated reversal for Earth. It is a fight for liberty. Everywhere, save on Earth itself, Martians have by this time risen in thousands, determined as only a persecuted people can be, to end Earth's oppression. You came to Mars and found an old race—old, before yours began. We were prepared to be friendly, but you let loose your adolescent cruelty upon us. You could not understand that a people may outgrow the futilities of war and strife. You called us decadent and weak.

"This impression, colored with fictitious stories of our vices, was suggested again and again to all Earthmen, and, such is the immense power of suggestion scientifically sustained we became to your minds, monsters of depravity. The truth—that we were an old race, resting as a man rests when his work is done—was not allowed to percolate into your thoughts. You have disturbed our content; stirred us from our peace, and your oppression has meant our rejuvenation. Old Mars has had to arise in all her ancient might against alien barbarians."

The first officer stepped forward with fists clenched.

"Barbarians? *You* call *us* barbarians?"

Pistols waved him back. Sen-Su shrugged his shoulders.

"If a demonstration of barbarity were needed, you have given it. You react like an animal."

"But you cannot hope to subdue Earth and all her millions," Joe objected. "For one thing, there are not enough of you."

"True. And that is not our intention. For one thing, it would be as barbarous as your treatment of us. We merely refuse to let ourselves and our planet be further exploited for one-sided gain. Now, I will leave you—I have important matters to attend to. I trust that I have made the situation clearer."

The Martian party retired leaving an astounded group of prisoners behind them. The situation had indeed been made unpleasantly clear. Sen-Su's manner and restraint in itself had been a shock to men who had been taught to consider all Martians as mere semi-civilized degenerates who should be thankful to Earthmen for introducing the strong hand of control. His moderation was a contradiction of all their schooling. Torrence expressed his ill-controlled anger in threats. Angus, for once, was silent. He looked thoughtful.

"You know, Sonny," he remarked after a while to David, "I've got a feeling that there's a deal in what the man said."

David nodded his agreement.

"I know. I've got that feeling, too. Of course, we always have been told what swine the Martians are, but how much of that is just politics? Has any of us here ever really known the Martians?"

Torrence looked across and became conscious again of his position as first officer. His anger, moreover, had not abated.

"So that's the way of the wind? Not only is our ship seized by pirates and our captain killed, but we have traitors among our own officers." His voice was truculent. "Well, we know how to deal with traitors, don't we, boys?"

He looked around as he finished the question, but the response was curiously half-hearted. Most of the men turned their gaze aside rather than meet his. Angus stared at him with a pair of cold, hard eyes.

"You're a fool—but for that, I'd knock your rotten teeth and your insults down your throat together. I'm every bit as much against the Martians as you are, but that's no reason for fooling myself with a deck of lies."

"You're calling me a liar?" Torrence rose.

"It seems to me we've all been hearing or telling lies about Mars, but that doesn't say I'm backing the Martians. If somebody in the Solar System has to get a bad deal, I'm still going to do my best to see it's not Earth."

"You were talking sedition," Torrence retorted doggedly. "You and Robbins, there. As senior officer it is my duty—"

Angus had crossed and stood over the other, his long arms swinging ready.

"Your duty is what? You miserable little half-baked, wooden-headed—"

Joe Seely hurried to intervene. He swiftly retrieved the paper he had stowed in the space-suit pocket and waved it at the rest.

"Say, here's a bit of news for you," he called loudly. "That thing that broke into the guard room wasn't a meteorite—it was a message rocket."

They all turned incredulously. Message rockets, as they all very well knew, had been banned by government decree for over twenty years.

"You mean to say the thing lodged aboard us?" David asked.

"I do, and here's the message."

Joe unfolded the paper carefully and laid it on the mess table. The others, forgetful of the brewing fight, came clustering round him.

"The fellow who invented those things ought to have been sent off in one himself," said Angus. "It's a safe bet they've wrecked more ships than they've ever saved." He leaned over Joe's shoulder and peered down at the sheet.

The date at the head was the fourteenth of August in the year 2052 A. D.—twenty-five years ago. For that quarter of a century the message rocket, having missed its objective, had been floating aimlessly in space, to end by causing the death of thirty and more good men. It was no wonder the devices had been banned. The message was brief, but plain:

"*Rocket ship,* RED GLORY *(C. O. 1009), passenger liner bound from Earth to the Moons of Jupiter. Disabled in the asteroid belt, and wrecked by forced landing upon planetoid believed to be Asperus. 300 survivors. Radio out of commission. Send help.*"

The signature at the foot read: "*James Stuart, (Captain).*"

Angus bent down to look more closely and assure himself that there was no mistake.

"Old Jamie, by the Lord. It's a small system. Does anyone remember a rescue from Asperus?"

No one did.

"Then it's odds on he's there still—if he's alive."

"If they navigate properly, we should make Asperus in a couple of days," remarked David. "And, by the look of things at present, we'll have plenty of time to make a search."

CHAPTER III

On Asperus

● The imprisoned officers crowded to the windows as the *Argenta* slowed for her landing by circling about Asperus. The planetoid, although larger than Eros, had been discovered later, possibly because its orbit is almost circular while Eros, traveling his very oval path comes close to the Earth at times. Another difference between them is that Asperus is a spherical body while Eros, strangely enough, is not.

The name, "Asperus," denotes, as it should, a world craggy and broken to the last degree of roughness, but it carries also a suggestion of barren severity which is entirely misplaced. On the contrary, vegetation is profuse.

As they watched the tumbled landscape far beneath, David gave such scraps of information as he could dig out of his memory. The diameter, he told them, was just under five hundred miles, thought the density of the core was many times greater than that of Earth. The period of rotation was almost exactly twelve hours, and its year, 1,600 earth-days in length. Geographically he could tell only that it possessed two large seas, much broken with islands. But the men paid him little attention, they were far too interested in examining for themselves the world which must support them for an indefinite length of time.

Profuse is an inadequate word to describe the vegetation which clothes this pocket planet. They could see all the land wrapped in a green blanket from which, here and there, only the craggiest of spires pierced upwards in their rocky nakedness. Foliage sprang from every pocket of soil, bushes waved atop the most unlikely peaks and festoons of swaying creepers hung down from the ledges like green waterfalls pouring into the still denser growths below. Occasional gleams of water showed where steep-sided clefts had succeeded in trapping miniature lakes, and, infrequently, there occurred larger, shadowed valleys which could show level ground dotted with not inconsiderable trees. As the *Argenta* swept nearer still, a half-checked exclamation burst from Angus. He pressed closer to the window.

"What is it?" asked Joe, beside him.

But Angus made no reply. For the present he was keeping to himself the knowledge of a bright, metallic glint which had flashed from one valley. He marked the spot mentally by the queerly twisted crag which dominated it.

The ship, now traveling slowly, searched for a landing. A few moments later she was sinking gently to a green spread berth. Joe voiced the general sentiment as they touched.

"Well, we might be in a worse hole. There's certainly no desert here like there is on most of Eros. Even the mountains don't seem so high when you get the right proportions—nothing like Earth's mountains although they're so broken."

Doctor Cleary, the medical officer, surveyed the scene less kindly. It would probably, he thought, mean a lot of work for him; this transferring of species to an alien world was not always the simple matter it appeared. But he made no comment; optimistic men are healthier than pessimists.

An audible bustling began to take place about the ship. There came a clang as the exit ramp was lowered. They watched the twenty-eight members of the crew march out under an escort of armed Martians, and turned sharply as the door of the mess room was flung open.

"This way!" ordered a sing-song voice.

They were conducted first to their cabins where it was permitted, under supervision, to collect such personal belongings as they might wish to take, and thence to the open. Sen-Su, personally supervising the expulsion, regarded them negligently as they passed him, but as they stepped off the ramp, he gazed more intently and a line appeared between his brows.

"Fu-Tan," he called, "how many officers are present?"

"Six, sir."

"There should be seven."

The man addressed as Fu-Tan looked puzzled for a moment, then:

"The tall man, the engineer, is missing," he said.

"Find him at once."

● It was a mystery how Angus had managed to slip away. Neither the Martians nor his companions had noticed his going. Fu-Tan raised his lilting voice in orders. The business of unloading supplies for the exiles was suspended while all but a handful of guards joined in the hunt. It proved brief, for the *Argenta* was deficient in good hiding places. An approaching hubbub in the corridors soon suggested that the escaper had been caught; muffled broadsides of blistering blasphemy tended to confirm the suggestion. Angus, still muttering and cursing, appeared at the head of the ramp and was hustled down. Sen-Su smiled at his angry face.

"No stowaways on my ship," he said.

Angus' reply was unprintable, but had the other looked a little more closely he might have discerned an unaccountable gleam in the engineer's eyes.

The unloading of food and medical supplies was resumed. Reports on Asperus stated that edible fruits grew abundantly so that the preserved food was more of a luxury than a necessity. When all the cases had been stacked, each man was given a broad-bladed, razor-edged knife some eighteen inches long.

The guards filed back into the ship. The ramp was withdrawn and its covering port made firm. A preliminary roar came from the rocket tubes. The *Argenta* lifted a trifle by the bows, then, with a blast of power, she was gone, climbing on a steep slant into the heavens. Gloomily the stranded Earthmen watched her shrink.

"Well, it can't be for long," said David, at length. "Once they find that Sen-Su's in circulation again, they'll realize what's happened and send for us."

"And a pretty pack of fools we'll look," returned Joe. "The marooners marooned . . . What the devil's the matter with you?"

Angus, to whom the last part of the remark was addressed, was emitting a series of explosive grunts, suspiciously like laughter.

"Well, for a queer sense of humor, commend me to a Scot. What's so damned funny about this, I'd like to know?"

Angus got a hold on himself. "Sen-Su thinks he's marooned us."

"Not a bad think, either."

"Yes, but he can't get away. I wasn't trying to stowaway. I got along and opened the draining valves. He's not got enough fuel left to get clear. Our job was to dump him and his bunch, and we've done it in spite of them."

"I'll be . . . So that was your little game. Angus, you're a genius." Joe slapped him on the back.

The spirits of the whole company rose. Even though they had lost their ship and been stranded, Angus had saved them from falling down on the main job. After a hurried discussion, it was decided to put some distance between themselves and the valley. When the Martians should notice their supply dials, it was considered likely that they would head back there, and no one was anxious to try conclusions with a shipload of angry Martians. The next question arose over the direction to be taken.

"I suppose one way's as good as another?" asked Joe.

"No," Angus advised. "Down to the south of this I saw something as we came over, and I'm willing to bet it was the wreck of the *Red Glory* or some other ship."

"Taking a lot on yourselves, aren't you?" Suggested Torrence. "I'd just like to remind you again that I am in command here." He looked round to see how this information was received. The men's expressions told him little. No one wished to mutiny, but if it came to a choice of leadership between a man promoted through influence, and one who had roughed the ether for many a year, they knew which to prefer. Joe Seely set himself to manage a tactful interposition with the result that the party moved to the south under the nominal leadership of the first officer, and the practical guidance of Angus.

● Travel across Asperus was a curious sensation for Earth-bred men. Those with experience of planetary exploration managed to adapt themselves in short time to the low gravitation, but the novices continued to overshoot their aims again and again before they learned to guage truly the amount of effort required. It was exasperating for these tyros to be carried sailing past their objectives by ill-judged bounds, but there was little danger of harm since descent seemed a matter of floating down rather than of falling. For half an hour Angus set a stiff pace, launching in a series of powerful leaps over such country as would have baffled all but the most skillful climbers had they had to contend with earthly gravitation.

He noticed as he went that the mountains were pitted with frequent caves, some obscured by screens of bushes and creepers, but others showing as stark, black holes in naked rock faces. The thought struck him that they might prove useful hiding places in case of pursuit. There was some grumbling from the rear about the unneceasary speed, but Angus knew what he was about. He was convinced that the *Argenta* would make for the valley where she had set them down, and his ears were wide open.

At the first mutter of distant rockets he gave the order to take cover and they crouched in the bushes, watching the ship as she swung like a silver shuttle above them. She sank slowly down behind crags they had already crossed. Angus gave the "all-clear," and moved on in fantastic, flying leaps towards the south.

* * *

Night fell with surprising suddenness. Angus had hoped to reach the wreck while daylight lasted, but Asperus' swift revolution whisked the shrunken, distant sun out of sight while the rugged landmark was still several miles ahead. They were left without light save for the sheen of accompanying asteroids and the glimmer of far-off constellations, almost unaltered. Travel over such country became well-nigh impossible.

Torrence suggested that the short night should be spent in one of the many caves, and Angus offered no objection. They had secured a good lead over the Martians and, even were their trail to be discovered, little or nothing could be done until dawn. One of the men reported a large cavern a few yards back. Torrence found it and led them into the gloom; his sword-like knife ready to his hand.

Angus struck a match, carefully shielding its rays from the entrance. By the flicker they could see a floor some twelve feet across and so dry as to be dusty, stretching back into the body of the mountain until it became lost in the blackness. The sides curved up into an arched roof five feet above ther heads.

"Excellent!" pronounced Torrence briskly. "It is dry, the entrance is not likely to be discovered and it is easily defensible."

Angus started to speak and then restrained himself. The first officer was touchy and would certainly take any objection as a new attempt to belittle his dignity. Nevertheless, the engineer was uneasy though he would have been hard put to adduce any reason for his misgiving. Perhaps he had inherited a lingering fear of those hobgoblins and gnomes who had, according to legend, so sorely harassed his Celtic ancestors. Whatever the reason, it caused him to lie close to the entrance. Soon the sense of disquiet passed and he, like the rest, save for the sentry at the cave mouth, was asleep.

He awoke with a start. His hand already gripping the knife by his side. From somewhere came the whispering

swish of a faint, ghostly movement. He looked towards the entrance and half started up. The sentry was no longer standing silhouetted on the ledge. A faint shuffling on the other side brought him round, trying vainly to pierce the wall of darkness. Stealthily he drew his feet up and settled the long knife more firmly in his hand. A scrape and the clatter of a loose stone jerked his head back to the entrance, and he drew a sudden breath. Black figures were stirring; indistinct outlines against the dark sky. Moving shadows: not the short Martians he had half expected, but grotesque, shrouded figures, six feet and more in height.

CHAPTER IV

A Sudden Discovery

● It was no time for inquiry; the vanished sentry told enough. Already a pair of the creatures were within the entrance. He could see them bending ominously above his sleeping friends. With whirling knife he leapt silently upon them. He felt the keen edge bite home and, simultaneously, there came a cry. A scream, but a scream no human throat could give; a mournful ululation with a harsh stridency which shredded the silence.

Confusion broke loose. The men sprang up, startled, yet bemused with sleep, and groping for their knives. The black prowlers retreated before Angus' circling blade, making headlong for the open. Twice more he felt the steel cleave deep before he gained the cave-mouth. The air sang in his ears with the shrill screams of alarmed and injured creatures.

He saw a half-dozen launch themselves into space as he came out upon the rocky ledge. Black forms which fell for a moment and then spread monstrous wings to check the fall. He watched them move in slow, powerful beats as the creatures rose and banked. Not for an instant did they check their desolate cries. Harshly the sound echoed in the shadow-hidden valley beneath and from further and yet further crags sprang answering cries like the wailing of funereal despair. A crescendo of screeching lament tortured the still night to pandemonium.

Mixed with the shrilling came the hoarser cries of striving men. Behind Angus a crowd of milling figures struggled and slashed in the dark, combating invisible opponents. With a stentorian command he dispersed the panic of their rough awakening and shook them into reality. They lowered their weapons and stood alert, breathing hard. From the dark, mysterious tunnel behind came the sounds of hurried feet mingled with those of occasional cries eerily echoing against the walls; sounds which grew fainter as their makers fled into the rocky heart of the mountain.

"What—what were they?" Torrence's dignity had fallen away and his voice was shaky.

Angus made no reply. Instead, he struck a light and counted the white, startled faces about him.

"Twenty-seven."

Nobody commented, but a number of heads turned to let their owners gaze fearfully into the blackness whither two officers and six men had passed to an unknown fate.

"And Davie, and the rest are at the mercy of these blasted things—whatever they are," growled Angus.

● With the dawn they were able to examine the bodies of two of the assailants Angus had felled. They were bipeds, and that, together with the disposition of organs common to most mammals, gave the impression that they were at least semi-human. Other characteristics did their best to counteract the impression. The creatures were a dull, metallic grey in color, tall, thin and fragilely made. Attenuated arms, so long as to reach almost to the feet, were linked to the legs by enormous spans of membranous wings. Their only weapons appeared as cruelly curved claws at both the fore and hind tips of the wings. The size and shape of their half-human heads seemed to suggest an intelligence of some order. High enough, at least, to embarrass seriously a small party armed only with knives.

Nevertheless, Angus wished to lead a rescue party. He was dissuaded only with difficulty. The others managed, at last, to convince him that it would be more than foolhardy under the circumstances to attempt the exploration of the unlit caverns containing unknown numbers of the winged creatures. David Robbins, Doctor Cleary and the six men with them must be abandoned for the present, at least. When—and if—they should discover the *Red Glory*, they would have a stronghold, and—they hoped—weapons.

● "The best thing we can do now," said Joe, in conclusion, "is to get right along, before those Martians get busy. They're sure to be on our tracks after that hullabaloo last night. We've got to settle with them before we can get a line on these flying screechers—the betting is that our men are safe for a while, if they're not dead already."

For an hour Angus led on, leaping prodigiously, climbing and scrambling through valleys choked with foliage and up precipices whose faces were hidden behind thick tresses of creeper. If he had any doubt of the direction, any uncertainty; no suspicion of it was allowed to appear. They paused only once. Beside a stream in one of the lesser valleys, a man caught his foot in something which rattled drily. He jumped back with a cry which caused the rest to stop short.

"What is it?" Joe called.

"A skeleton, sir," the man reported.

Joe came back. He saw at a glance that the bleached bones were human. Tangled among the ribs, he caught a glint of metal and drew out a slender chain on which swung an identity disc.

"Will Fording, Chicago, Radio Operator, *Red Glory*, (C.O. 1009)," he read.

He picked up the rifle which lay beside the remains. It was utterly useless and caked in the rust of many years accumulation.

"Poor devil—wonder what got him?" he murmured.

He dropped the gun and slipped the identity disc in his pocket. The party went on its way slightly chastened. So far they had encountered no sign of native animal life beyond the grey creatures and a few insects. The radio operator might have died of sickness or accident—it was impossible to guess with the little they knew of this queer planetoid.

An hour later, they breasted the final rocky ridge to gaze down on a sight which brought excited exclamations from them all. Close to the far side of a valley somewhat larger than any they had yet encountered lay a space ship of antiquated design. Her untarnishable plates still glittered in the sunlight, but half surrounding her were

deep growths of a sturdiness which told that it was many years since she had sunk to this, her final, berth.

Angus' sharp eyes picked out the name *Red Glory* inscribed in faded letters upon her prow; beneath, half obscured by branches, he could make out a part of her Chicago registration number. But it was not the sight of the ship which had caused the party's surprise. They had expected no less. Their exclamations were due to the fact that the undergrowth before the entrance port had been cleared away. A broad path led from the ship to several acres of cultivated plots beside the stream which wandered down the centre of the valley.

Joe, for one, felt a rush of relief. Since the previous night's encounter he had been aware of growing doubts that any of the *Red Glory's* complement could have survived.

"*Red Glory*, ahoy," yelled Angus.

No voice replied though he fancied he saw a flicker of movement at one of the cabin windows. There was no wave of a welcoming arm such as he had expected. They hastened down the steep wall and across the valley floor. Midway up the cleared track to the open port, a voice called them to halt. Before and behind them figures oddly clad in rough materials stepped from the concealing bushes. All were men, and all held rifles trained upon them. A young man—Angus estimated his age at twenty-three or four—stepped forward and approached with wary suspicion.

"Who are you, and where do you come from?" he asked.

Torrence replied, and the young man watched him intently as he spoke. He seemed slightly at a loss. As he began to reply a figure made its appearance in the entrance of the *Red Glory*. An old man who stooped, and whose white hair hung down upon the shoulders of his coarse woven coat, but who still gazed with keen eyes from a weather beaten face.

"Jamie!" cried Angus. "Jamie, don't you know me?"

● The old man's face cracked into a smile.

"Aye, Angus, lad, it's you all right. Come along in and bring your friends with you."

With one hand he waved away the riflemen who appeared bewildered, but retreated obediently.

"Well I'll be damned," muttered Joe, "does he think we've just dropped in to supper?"

Angus grinned.

"You could never surprise old Jamie—no one ever has."

Accompanied by the riflemen who had not entirely lost their suspicion, the party filed aboard the ship.

They entered the main living room to see a group of girls arranging baskets of strange Asperian fruits on the tables.

"Ye'll be wantin' some food, I doubt," said Jamie. "And ye can talk while ye eat. We heard your rockets yesterday," he continued. "The first rockets I've heard in twenty-five years—man, it was grand; like music."

As the tale of the *Argenta* was told, more and more men and women and a number of children came crowding into the room. With some surprise Joe noticed the predominance of youth. There might have been perhaps thirty persons of middle age, and a few besides Jamie of advanced years, but the rest fell, almost without exception, below the twenty-four level. A number of them were introduced including the suspicious young man who had waylaid them. He, it transpired, was Andrew Stuart, son of old Jamie. Greta, one of the most attractive of the girls, was his wife.

Jamie heard their story through with little comment, but at the end he called Andrew to him and directed that a scouting party should be sent out. He looked a little worried as he turned back.

"We've got to keep these Martians away," he said. "'Tis a pretty situation—they've got a good ship and no fuel, while we've got a useless ship, but there's plenty of fuel in her tanks yet."

"Have you got rifles for us?" asked Angus.

"Aye, and pistols—more than we can use."

Angus looked surprised, but a look in the old man's eye checked his question. He decided that Jamie had been doing a little gun-running as a sideline, and would not relish inquiries. Instead, he asked:

"What about your story? And what about these flying things? We're all sort of mazed."

Jamie began his history from the disablement of the *Red Glory*. They had run into a meteor shower and had been lucky in not being carved to bits. Happily most of their score of leaks had been small, but the radio had been demolished and the relief operator who was in the room at the time, killed. One mixing chamber for gases had been wrecked, putting a number of tubes out of action.

They had set about limping for the nearest approaching body which they had believed to be Asperus. And, thanks to the low pull of the planetoid, managed a successful, if ungraceful landing. Thereafter a number of message rockets had been dispatched without result. The exact number of survivors, including passengers and crew, had been three hundred and seven.

In those first days Asperus had seemed a not unkindly place. It produced the necessities of life in abundance, and there was a feeling that fate might have been far more severe. Then, a week after the landing, fifty of their number, many of them women, disappeared. A search party was sent out and never seen again. Up to this time they had seen nothing of the grey, winged creatures which they later came to call by the name of "Batrachs." A second search party met a similar fate and still more of the survivors disappeared until, at last, Jamie had taken a firm stand.

Every sunset the door of the *Red Glory* was closed and locked and remained thus until dawn; nobody, under any circumstances, being permitted to go out by night. The numbers had now been reduced to sixty-five, omitting children. The Batrachs made bolder by their captures had besieged the ship for several nights, but, finding it impregnable, at last abandoned the practice. For several years now no member of the *Red Glory* colony had set eyes on a Batrach.

The creatures were strictly nocturnal in their surface operations, and the men became no less strictly diurnal. From that time the little colony had begun to prosper. Jamie from his position as captain had slid to the status of patriarchal ruler.

"But these Batrachs?" inquired Angus. "You had guns to fight them with?"

"Yes, we had guns," Jamie nodded, "but so had the expeditions and they never came back. After all, laddie, a gun, even if it fires rocket shells, is at a disadvantage in the dark, and the Batrachs don't come in ones or twos, but in thousands. You were lucky last night; the only

reason you are here now is that they didn't expect you. If they had been prepared—" He spread expressive hands and shook his head.

CHAPTER V

To the Rescue

● Sometimes, Jamie admitted, he had thought of leading out yet another search party, but it was his duty to stay with his ship and protect the survivors to the best of his ability. There had been marriages. Jamie, as captain, had performed them, even his own. He had now become, he said proudly, not only the father of two boys and two girls, but a grandfather as well. The Batrachs, in his opinion were the only unhealthy things about Asperus; all the children of the colony had flourished though he considered them slightly underdeveloped muscularly by reason of the lesser gravitation.

Angus, seeing that the story was tending to become a family history, pulled him back to the subject of Batrachs. Couldn't Jamie give more details about them? What did they do with their prisoners? What was their level of little. Jamie considered them almost equal to men in in-intelligence? Did they ever use weapons? He extracted telligence—save that they never used weapons; of their treatment of prisoners he could say nothing, for no one had ever returned to tell. His tone showed plainly that he thought no one would, but Angus had different ideas on that subject.

Talk was cut short by the return of a scout who reported that the Martians were encamping in the next valley. Thoughts of rescue were temporarily put aside. Sen-Su and his little lot must be settled first.

First officer Torrence again emerged from that oblivion to which events seemed to condemn him. He proposed a sniping party. The suggestion met with a cold reception which genuinely astonished him. Angus was particularly incensed.

"This is not a murder gang. Our orders did not extend beyond marooning a bunch of political prisoners. They didn't ill treat us when we were at their mercy—"

"They're nothing more than a lot of damned pirates, and the penalty for piracy is death."

Angus kept his temper with difficulty.

"That's as may be. If they had been real pirates, we'd now be so many corpses floating out there in space. I, for one, refuse to shoot them down in cold blood. They treated us well."

"They murdered Captain Briscoe."

"That's a lie!"

"This is mutiny." Torrence's eyes were gleaming. He turned as though to appeal to old Jamie, but Angus cut him short.

"I don't care if it's sacrilege—I'm not going to do it. Get that?"

Joe joined Angus. He, too, preferred mutiny to murder. Torrence glared helplessly. The odds were against him and he was wise enough to know that the men would back Angus in any dispute. He could do no more than give in with bad grace. The party would stay in the *Red Glory* and let the enemy fire the first shot, if shots there must be.

"It's checkmate," said Angus. "Sen-Su will realize that mighty soon. Jamie tells me there are plenty of supplies aboard and they couldn't get us out for months. My only worry it that if they keep us cooped up here we shan't be able to find out what's happened to Davie and the others."

All the men of the colony were called in for safety's sake. There was little over an hour of the short Asperian day remaining, and there was the risk of their being cut off by a party of Martians. Once or twice glimpses were caught of the little brown men on the escarpment of the further side, apparently bent on reconnaissance.

"Cooping up" seemed to be the program, for when Torrence went to the entrance port with a rifle in his hands, the warning smack of a bullet on the steel side above him, caused his hasty retreat. Angus grinned when he heard of it.

"Teaching the sniper a few tricks, are they?" he said.

Night closed in without any further signs of activity. The port of the *Red Glory* was swung to and locked by old Jamie in the manner of one performing a ceremony. All sound of the outer world was shut away. The Martians could do what they liked; no portable weapon would be capable of making so much as a dent in the space ship's armor.

● Angus awoke with a hand shaking his shoulder. He looked up to find Joe bending over him.

"Blast you, what's the matter?" he mumbled sleepily.

"Looks like a deputation. Get your clothes on and come along."

Dawn had just broken and from the windows of the living room they could observe three Martians who stood looking towards the ship. They had reached the beginning of the cleared pathway and were plainly ill at ease. The central figure upheld a stick to which was attached a piece of dirty, white rag. It was obviously intended for a sign of surrender. But why, Angus asked himself, should the Martians wish to surrender? All three men had evidently suffered rough handling for their clothing was little more than a covering of tatters stained with blood. After a short consultation the two flanking men lifted their empty hands above their heads and all three advanced. Old Jamie hesitated a moment and then unlocked the port, beckoning to them to enter. The questioning he left to Angus who began with the monosyllable;

"Well?"

The middle man, looking askance at several pistols trained upon him, lowered his flag of truce and answered with the characteristic lilt:

"We have come to surrender."

Angus frowned. This was not his idea of Sen-Su's methods.

"And the rest of you?" he asked.

"There are no more." The Martian spoke slowly and with a depth of dejection.

"Talk sense. There were ninety-seven of you. Where are the rest?"

"All gone. We were attacked. Great winged monsters which screamed fell on us out of the night. We shot at them and then we fought them hand to hand, but it was dark. There must have been thousands of them. We three got separated and they overlooked us or thought we were dead."

"All the rest are dead?"

The Martian shook a sorrowful head as though he considered the indignity greater than death.

"Only a few. The rest they took away. In the fight

they seemed flimsy, but their wings are strong. They lifted our men, two to a man, and flew off with them.—I don't think they took them far. We came to you because"—he hesitated uncertainly, uncomfortably—"because you are our kind," he finished abruptly.

Angus studied him hard, seemed satisfied, and nodded.

"We'll go and see your camp. Maybe we'll learn something there."

Torrence demurred. "It's a trap. They knew they couldn't touch us in here, so they're getting us into the open."

Angus ignored him. The first officer's prestige had fallen to zero with the defeat of his sniping proposition. A dozen men, including old Jamie, set out to investigate.

The Martians had made a clearing for their camp, and when the Earthmen reached it they stopped to gasp aloud. The brown men had excelled themselves. It was the scene of an epic battle. Slaty, grey winged bodies strewed the place—literally hundreds had fallen in that fight. Not only was the ground a bloody shambles of hacked and twisted forms, but in the surrounding trees and bushes hung the corpses of those shot in mid-air. Lanky shapes, somehow unclean, their listless great wings stirring in the gentle breeze like patches of dirty sailcloth, while the steady drip-dripping of their crimson blood incarnadined the leaves below.

For some moments no one spoke. In Joe's mind arose the dim memory of old engravings depicting hell. Then Angus broke the silence.

"What a carnage. I've seen slaughter in my time, but this . . . "

The three Martians went forward and examined the dozen or more bodies of their men lying among those of the grey attackers. The wing talons had made them unpleasant sights.

"Sen-Su?" asked Angus as they returned.

They shook their heads. The leader was not with his dead.

● Angus threw back his head and looked speculatively up at the caves in the valley sides. Below one a glimmer of something bright caught his eyes. He pointed it out to Jamie, and the old man brought a pair of binoculars to bear.

"The buckle of a belt," he said, "a broad, Martian belt."

Angus gave the order to return to the ship.

"You're not going after them?" inquired Torrence.

"That's just what we damn well are."

"But they're enemies and it's our duty—"

Angus stepped close to him.

"See here, you know too doggone much about duty. The Martians are human beings—they're our own kind. What's more, there are our own men to be found too. If you think I'm going to stand by without reason while men of Earth, or Mars, are in the power of these repulsive spawn of miscegenation, you'd better think again. Get that?"

Torrence wisely withdrew. Old Jamie proved reluctant to let them go, and sternly forbade any of his colonists to take part. He did his best to dissuade Angus though his manner showed that he had little hope of succeeding. Perhaps he spoke from a sense of duty, for when he found that the other was determined, he became lavish in his offers of weapons.

Rifles were discarded as unsuitable, but he insisted that each man should take several pistols since, in the unlikely event of success, the rescued must be armed. He pinned most faith to the long knives which would be invaluable for in-fighting. In addition, he insisted that all the available lamps be collected and affixed to the chests of the rescuers.

The *Red Glory* colonists collected to bid them farewell. There was a suspicion of envy in the eyes of some of the younger men, but Jamie's word remained law.

"Good luck, laddie, and God be with you," said the old man to Angus.

He watched the twenty-seven from the *Argenta* and their three Martian companions with wistfulness as they scaled the valley wall. That was the spirit which had taken the Earthmen all over the system. Confidence that they could not lose the game. The last figure turned and waved a hand as it disappeared over the skyline. Old Jamie sighed. He wished he were young again, he'd show them—but he wasn't young. He was an old man, and getting sentimental.

He sighed again and turned back into the *Red Glory*.

CHAPTER VI

The Captives

● David awakened to a species of bedlam. He could hear Angus' shouting voice making a bass accompaniment to an unearthly screeching. He heard the other men jump up from sleep and leap into action. He started up with them, fumbling for the knife in its scabbard by his side. His hand was upon the hilt when long arms wrapped around him, pinning his own arms. He cried out. Dimly he could see furious activity taking place in the cave-mouth; dark shapes which jerked and fought. He struggled against the retaining arms aware only that this was an attack, by whom or what, he could not tell, though his mind jumped to the conclusion that the Martians were somewhere back of it.

He opened his mouth to call again, but before the cry came something was wrapped around his head. A dark sheet of unfamiliar substance which, by its feel, sent a surge of panic through his nerves. He lashed out as far as he could reach with his feet, but a moment later they were snatched from under him and secured by arms which seemed to wrap themselves more firmly about his legs than any human arms could hold. He wriggled, trying vainly to jerk off the grip. Through the shroud about his head he could still hear the sounds of turmoil, but they were swiftly growing fainter, and he could tell from the motions of his captors that he was being carried away.

At length the sounds dropped behind altogether, and the silence of their progress was broken only by soft footfalls and occasional, high pitched cadences from his bearers. He succeeded in twisting his head in the folds which covered it, and began to breathe more easily. With a faint hope, growing ever fainter, he strained his ears in hope of pursuit. At last, hope died altogether. Perhaps all his companions had also been captured; perhaps they were dead; he did not know. He was only aware that all hope of rescue had gone.

For seeming hours the steady progress continued. At last his bearers seemed to find their method of transport inconvenient. They halted and set him on his feet. The arms about him remained inexorable, but the stifling cover was removed from his head. Thankfully he drew

great breaths of fresh air, but he could see no more than before. The darkness was solid; unrelieved by the faintest glimmer. There came sounds of much movement near at hand. A few shrill notes such as he had heard before, and a grunt which might have come from a human throat. His heart bounded, and he decided to risk the return of the stifling cover.

"Hullo? Who's there?" he asked quietly.

An exclamation of surprise came out of the darkness.

"Cleary here. That's Robbins, isn't it?"

"Anyone else?"

There was no answer.

"I'm sure there were some others," said the doctor's voice. "But they're not here now," he added a little unnecessarily.

"What are these things, and where are we?" said David.

"Lord knows what they are, but we're certainly somewhere inside Asperus."

The captors continued to ignore their prisoners' talk. After a few minutes rest they picked them up once more and continued their way through the darkness. This time progress was less uncomfortable, since there was no smothering cover.

"Do you know how many there are?" David inquired.

The doctor did not.

"If we could only see what they're like, I'd feel less uneasy," he said.

They carried on a conversation in desultory phrases for some time. David had long ceased to struggle, and, as a result, his captor's hold had insensibly loosened. With the utmost caution he pressed his arms a little outward. His hand was already near his knife; with a little more play he might be able to snatch it out.

● The ruse began to work. The arms did not tighten with suspicion, but eased a little to rid themselves of the strain. David was beginning to extend his elbows further when the party came to a sudden stop.

From the darkness ahead came the click of something hard against metal, followed by a grating sound. Gates opening, David guessed. A moment later they stopped again and a similar series of sounds denoted another gate. Within a few minutes David began to see the first dim signs of reflected light on the wall where the tunnel turned, many yards ahead. He waited with a quickening excitement until he could see his captors. Two were carrying him, and, by turning his head, he could see two more dealing with the doctor. He took a deep breath and snatched for his knife.

The movement was a complete surprise. The first his bearers knew of it was that the blade was in his hand—it was almost the last they knew, for he cut at them savagely. Their screaming cries were deafening in the enclosed space. The hinder pair rashly dropped the doctor and hastened to their assistance. A second later he, too, was after them, knife in hand. David slashed wildly, dodging their raking claws and their attempts to entangle him in their wings. With the doctor's arrival in a rear attack, the fight was soon over. The two men, panting, faced one another over the four grey bodies.

"We must hide them quickly," said David. "Some more are bound to come along after all that row."

Hastily they dragged the corpses into a small side passage and stood tensely listening. After a little while they relaxed. The grey creatures' cries, whether of alarm, or for help, appeared to have passed unnoticed. The problem now before them was one of direction. The way behind was out of the question, for it was barred by gates, and they faced the alternative of creeping along dark, narrow side passages or risking the lighted area ahead. In the end they elected for the latter; both had had enough of the darkness, and their enemies seemed unhindered by lack of light. The doctor adjusted his glasses which he had miraculously retained intact. He was a small man, inclined to stoutness and showing, in normal conditions, a cheery, rubicund face.

"Yes, towards the light, by all means," he said.

He was aware of some slight professional regret that they could not spare time to examine the bodies of their late enemies, but he appreciated the necessity of getting clear.

They cautiously turned the corner ahead and found themselves facing a long vista of deserted tunnel lit at intervals by small, glowing lamps in the ceiling. There appeared to be no reason for this transition from darkness to light. David was aware of misgivings. This was the way their captors had been taking them, and it was obviously, for that reason, the way they should not go. However, if they should be attacked, they would have at least the advantage of seeing their attackers.

They walked on, every sense alert and their knives tightly clutched. To keep to the center of the way seemed safest; one could not tell what might lurk in the small, unlighted side passages. Two hundred yards further they rounded a corner and abruptly debouched upon a still larger tunnel. Should they turn left or right? This new way, as dimly lit as the other, gave no clue. They were able to see perhaps fifty yards in each direction before turns cut off the view. David was about to speak when the doctor checked him. A faint sound had reached him from the left. Both peered in that direction, but its origin remained hidden by the corner. They drew back into the lesser tunnel to wait.

The approaching sound resolved into a steady trudge; the swish-swish of soft slippered feet upon the rock floor. David breathed more easily, for the monotonous walk could not be made by anyone seeking to investigate an alarm. The steps slowly continued to near the end of their passage. A figure which looked neither to left nor right, passed by. Both the watchers stared. They had expected one of the winged creatures, but—

"An Earthman," gasped David.

The man caught his voice and turned towards them. He was elderly, and his head was but sparsely covered with grey hair. His face was pale and deeply graven with lines, but, for all its sorrow, it was kindly. Strapped upon his back he bore an enormous basket filled with broken ore. His expression changed to amazement as he saw them. He took an involuntary step in their direction and then stopped with doubt in his eyes. His attention seemed fastened more on their clothes than their faces.

"Who—who are you?" he asked in an unsteady voice.

David told him.

"You have come from 'Outside'?" Something in his pronunciation of the last word seemed to imply inverted commas.

"We have," admitted David, watching him closely, "and we want to know how to get back?"

● The old man slowly shook his head. A strange, musing look seemed to come over his face.

"There really is an 'Outside'? Sometimes I think it was just all a dream." He paused, looking at them with unseeing eyes. "But no," he added, "it was no dream. A man could not dream a sight so lovely as a tree with the wind in its leaves, or the glory of the sun, any more than he could dream the curve of a wave."

David and the doctor glanced at one another. The old man had forgotten their presence. He went on:

"Twenty-five years, oh God. Twenty-five years since I have seen those things." The last word was a sob, and the tears ran unashamed down his cheeks. David took hold of his arm. He spoke gently.

"You don't understand. We want you to show us how to get out."

The old man shook his head again.

"My boy, it is you who do not understand.—There is no getting out. Nobody has ever got out."

"But—"

"Nobody, in twenty-five years."

At the sight of their puzzled faces, he pulled himself together. The dreamy look vanished from his eyes and he spoke in a different voice.

"Come along with me. I'll explain."

David relieved him of the basket and fixed it to his own, more able, shoulders. He was surprised to find it much lighter than it appeared, until he remembered the small size of Asperus.

The three walked together along the tunnel, crossed a hall which showed signs of being a natural cavern enlarged, and entered another tunnel. His name, said the old man, was John Fordham, and he began to relate the disastrous history of the *Red Glory*. He had, it appeared, been among the first to be taken prisoner. He was still talking when they reached another rock-hall. In it a number of men and women were seated at long tables. All conversation ceased as they entered, and Fordham introduced them to the company:

"Two men from 'Outside.'"

The same look of suspicion that they had seen in Fordham's eyes appeared now upon every face, but, like his, it began to fade at the sight of the newcomers' clothing, as though their uniforms were assurances of identity. Both men and women present were clad in inadequate garments patched together from many pieces of coarse cloth. David estimated those present at one hundred and fifty, and subsequently that he was only seventeen short of the actual figure. Most of them were of middle, or later, middle age, with a sprinkling of the really elderly, and a very few younger members of approximately thirty or thirty-one. He noticed at a glance that women predominated.

With the lessening of suspicion they came crowding round, fingering the men's clothing as if it were something rare and precious, and asking innumerable questions. David slipped the basket of ore from his shoulders and dropped it on the floor. At his request for something to eat, bowls of fruit were immediately produced. The two attempted to answer the incessant questions as best they could. They described their own capture, but of conditions aboard the *Red Glory* they knew nothing. They could only say that Angus had sighted a wreck which might, or might not, be the *Red Glory*. At last the spate of questioning eased, and they had a chance to put their own perplexities forward. What were these creatures they called Batrachs? What was happening in this subterranean world? Was there really no possible means of escape?

Dr. Cleary was particularly exercised in the matter of the Batrachs. He had seen enough of them to form the opinion that they were mammals, but he was certain that no such forms had been found elsewhere in the system. He had a theory that similar systems produce similar forms, with, of course, adaptations to heat and gravitation, and he was fond of his theory. The presence of the Batrachs shook it severely.

Nobody was able to enlighten him. It was, it appeared, a subject never discussed with the Batrachs.

"You talk to them?" asked David incredulously.

"But, of course—or, rather, they talk to us for we can imitate only a very few of their sounds. To get anything out of us, some of them had to learn our speech."

"They're not savages then?"

"Depends what you mean by a 'savage.' The Batrachs are highly intelligent in their own way, if that's what you want to know."

"And your position is—?"

CHAPTER VII

"We're Slaves—Nothing More, Nor Less"

● David frowned in a puzzled fashion. He had just been told that the Batrachs numbered hundreds of thousands, if not millions. Surely it was not worth their while to enslave so few Earthmen. Several thousand slaves would have been understandable, but to maintain this handful of men and women couldn't even be economic. Ever since capture they had been confined beyond the double gates and all their food must be brought down from the surface. Their work could scarcely pay for the labor of feeding them. He put the point to Fordham who attempted to explain.

"As we told you, the Batrachs are intelligent, but their intelligence is difficult for them to apply. Perhaps you will find it easier to understand if I compare them with ourselves. Now, the first stepping stone of man's climb from savagery is really his opposed thumb. Don't misunderstand me, I know that there were lesser factors, and I don't forget that apes also have opposed thumbs, but the fact remains that without that useful tool, it is more than doubtful whether man could ever have risen as he has.

"Early man picked things up and played with them. He found in time, for instance, that if one stone were placed upon another, he could by standing on it, reach a fruit otherwise out of reach. He did not think the action out first; he did it by accident, and then took advantage of it. Once it had been done, his intelligence was stirred, and he could do it again. You see, this is the important point, his hands taught his mind in the beginning. The reasoning mind did not take real control until far later. If you doubt this, just consider how lazy people still try to make their hands teach their minds; they do it whenever they apply what we call a 'hit and miss' method. So much for contrast.

"The Batrachs' intelligence, however, is fundamentally different. Their minds have not grown from actions. Somehow their mental evolution has progressed without the promptings of physical organs. The result is that

they have reached a sticking point and they realize it. They can think, but they cannot *do*. They have no opposed thumb to help them. Control of their limbs is coarse compared with precision bequeathed to us by thousands of generations. Their talons have no more capability of fine accuracy than the claws of a tiger. They were —and are—in fact, in a very similar position to a paralyzed man. Their only method of getting things done is to cause others to do them. And we," he ended bitterly, "have been those others."

Cleary sat for some time in thought before he asked: "But this vast system of caves? They're artificial. If your theory is right, they couldn't have dug them."

"They might. It requires no great accuracy, and if you look you will see that all the work is rough and unmathematical in finish. But I suspect that there have been other captives before us. There are the gates. They are very old. Then, too, they have a few metal instruments—crude, of course, but certainly not made by the Batrachs themselves."

The doctor went on to ask more questions. The suggestion of the Batrachs' curious development interested him considerably. David's attention lapsed by degrees. He found his gaze wandering first over the rocky walls and bare utilities of this cave which, he understood, was the main living room of these lost Earthlings. From this he fell to examining the faces of those about him: tried to imagine what twenty-five years in such surroundings would mean, and failed. A sudden thought struck him. All these men and women had lived together for a quarter of a century . . .

"Are there no children?" he asked.

Even as the words left his lips, he realized that they were an indiscretion. A cold silence greeted the question. No one attempted an answer, and the eyes of all refused to meet his own. He had committed a dire solecism—touched a subject under strict taboo. It was queer—the condition of at least three of the women . . . He turned a bewildered face to the doctor. The little man shrugged his shoulders ever so tightly. Tactfully, he asked another question of John Fordham, and the awkward moment passed, though not without leaving a vestige of constraint.

Conversation was terminated by the sudden ringing of a bell. All present turned to face one of the tunnel mouths expectantly. After a wait of a few seconds, a figure strode out of it into the hall. Both men from the *Argenta* stared in surprise. They had expected the grey form of a Batrach, but the newcomer was a tall, well-built, young Earth man. His face, though clean cut, was pale and there was a sense of familiarity about it which David was at a loss to understand.

● The men and women respectfully drew back, leaving a clear space down which he marched without a sideways glance until he reached a small, desk-like table at the head of the cavern. At it he seated himself to face the gathering, and in a hard, emotionless voice began to recite the names of those present. They had leisure to examine him more closely.

His age was around twenty-three, and he had the air of a man who performed a distasteful duty conscientiously. His clothing consisted of a knee-length tunic below which appeared trousers. Both garments were embroidered with patterns of geometrical design, as were the soft sandals on his feet. The roll-call completed, he paused a moment, then:

"John Fordham," he said curtly.

The old man stepped forward. In a flash David saw the reason for the elusive familiarity of the young man's face. It was a youthful edition of the older man's. His son, perhaps? But there was no filial feeling in the curt voice.

"John Fordham, you have been reported to me as being one basket of iron ore short today. Why is this?"

The basket still lay where David had dropped it. As he made a movement to pick it up, the young man noticed him for the first time.

"Who are you?" There was the slightest flicker of surprise in his eyes as he scrutinized the pair. David hesitated and then explained, carefully omitting reference to the deaths of their captors.

"From 'Outside'?"

Curious, David thought, this manner of treating the simple word 'outside'. The present emphasis on it was very different from the old man's.

"Yes," he said.

"There has been a mistake. You should not have been brought here. You will follow me."

They hesitated, but David's neighbor whispered:

"Go with him. He will take you through the gates and you will have a chance then. You've still got your knives."

* * * * *

The young man took good care that his body should screen the combinations of the double gates as he worked them. The two with him noticed that they were leaving by a different route, for the tunnel was lighted and sloped steeply upwards.

In the walk of half a mile which followed, Cleary tried their guide with a number of questions which did not raise the success of even a monosyllabic reply. It was noticeable, also, that when they approached closely to him, the young man drew away with some ostentation. At length they began to meet or overtake others; men and women who had occasion to use one or other of the many side turnings. These, too, drew close to the walls as they passed, and more than once they saw noses wrinkled in distaste. The tunnel brought them at length to a hall.

The place was comparable in size with the cave in which the *Red Glory* survivors dwelt, but it was better lighted, and better furnished. It even showed attempts at decoration by strictly geometric forms. But the greatest difference was that it was filled with the cheerful sounds of laughter and young voices. David felt a lightening of the load of depression which had crept over him. The doctor continued to wear a frown on his round face.

To complete the contrast with that other cave was the fact that every man or woman in sight was young, and many small children ran or crawled upon the floor, romping as freely and happily as any child born on Earth.

A pale cherub of four was playing near the entrance. David smiled at him and extended a friendly hand. The child looked up at the sound of his voice. One glance was enough; he gave a frightened howl and ran to bury his face in the tunic of a young woman nearby. The look David received from her dark eyes was murderous and loathing. She hastened away, comforting the frightened child.

David turned to the doctor in amazement. He felt slightly resentful; children, as a rule, liked him.

"What is it? What's wrong here?"

Cleary, still frowning, refused to commit himself.

"I don't know yet, but I've got an idea—just the glimmer of an idea."

Their guide led out across the hall. As they approached the people shrank back to either side, the children ran whimpering to the women. Not a face in all the place, but expressed disgust. Twice they had to pause before groups which had not noticed their coming. Each time the young man called: "Outside," and the way cleared as though by magic. A queer fancy floated into David's mind—were not lepers in the East compelled to call "Unclean" with much the same result?

They left the hall behind and still continued upward through the labyrinth. Now and then they had occasional sights of the grey forms of Batrachs going about their unknown business. Mostly they were on foot, but in the larger tunnels it was possible for them to fly, passing over the Earthmen with great swishes of their dry wings. The lighting grew dimmer as they proceeded and soon it became necessary for the guide to produce a lamp

David began to toy with the idea of snatching the lamp and making a break for freedom. Surely, after all this climbing, they could not be far from the surface. He nudged Cleary and pointed suggestively to his knife. For some reason of his own the other shook his head. David let the matter drop and a few moments later, when the rays of the lamp fell upon another gate, was glad he had. It was opened like the others by a combination lock. The young man stood back for them to pass. The click of its fastening followed—but the man with the lamp was on the other side. Too late David realized what had happened. This was not another gate along the way, it was the door of a prison—and they, like fools, had walked straight into it. He drew his knife and sprang back, but the young man was safely out of reach. He turned away, paying no attention to David's threats, and soon his lamp became no more than a receding glow in the distance.

Darkness, intense and almost palpable, closed in. David shook the barred gate in futile fury, but he stopped abruptly at the sound of a movement in the blackness behind him.

"Who's there?" Mentally he cursed his voice for its unsteadiness; this dark was bad for a man's nerves.

A voice replied with a familiar, lilting tone.

"Good God, the Martians!" he cried.

CHAPTER VIII

Angus Invades

● Angus paused to muster his party at the cave-mouth.

"No talking!" he ordered, "and step as lightly as possible. The brutes are nocturnal, and it's odds on we'll catch them sleeping now. Come on!"

He switched on the lamp upon his chest and led the way into the mountain. The entrance cave was much like the one in which they had been attacked. The dry, dusty floor sloped down towards the beginning of a narrower tunnel in which they could not walk more than two abreast.

They wound for fully half a mile of its evenly descending length before they came to the first forking of the way. Joe guessed that already they were below the level of the valley outside. Angus stopped and turned an investigating beam up each of the facing tunnels. Both were similar in size and in the degree of use they showed. One of the men picked out a slight obstruction on the smooth floor of the right hand path. He jumped forward and returned, displaying his find.

"A Martian boot," said Angus, handling the soft leather. "Somebody in that gang knows his stuff. Let's hope he's managed some more clues."

The hope was fulfilled. They were subsequently assured that they were on the right track first by the discovery of the fellow boot, and, later, by the sight of a discarded cap. As yet they had had no sight of the Batrachs, and still the passages led down. Twice Joe, bringing up the rear, thought he heard a dry rustle behind him, but each time he swung his lamp, it revealed only the empty tunnel. They had now penetrated a long way into Asperus, and his suspicions were aroused.

"This is too easy to last," he told himself uneasily.

A few minutes later, his fears were borne out. An unmistakable, murmurous swishing came from behind him. And, this time, the lamp showed a solid phalanx of grey, winged forms sweeping down in a rear attack. Almost without thought he drew his pistol and sent half a dozen shots crashing among them. Not a bullet could miss. They hesitated as several of their number fell, and swayed indecisively for a second. They rallied and came on, but their advance now was slow and deliberate. They appeared to have abandoned the notion of coming to grips.

Angus continued to lead his men steadily forward. Retreat was, for the present, cut off, but that had been almost inevitable in such catacombs. There was more pressing business to be attended to before they had to worry about the way back. Joe reloaded his pistol and held it ready.

A turn of the passage brought them without warning into a large cave. The many black tunnel entrances dotting the walls on all sides suggested that it was a meeting place, a kind of public square of this subterranean world. By far its most disturbing feature was that in almost every entrance lurked grey, menacing figures. Angus grasped the danger at once. The Batrachs would have full room to use their wings and could attack from all sides simultaneously. Already not a few were taking to the air. The way behind was blocked. A swift glance showed that the tunnel directly opposite held no guard, and, at his command, the Earth men made for it, crossing the wide floor in a series of leaps. To their surprise they reached it unattacked. The sense of uneasiness grew. The Batrachs followed at a distance.

"Don't like this," muttered Angus. "From what we've seen of them, they're fighters. I'll bet anything the blasted creatures have got something up their sleeves."

Nevertheless, they continued unmolested for several hundred yards. Then, at a corner, Angus stopped dead. The way ahead was choked with Batrachs who stood blinking in the glare of the lights.

"Oho! So that's it. Sandwiching us, are they?" He settled a pistol in one hand and a knife in the other. "Now for it!"

But still the Batrachs did not attack. There was a puzzled pause. Angus opened his mouth to speak, but before a word came, the floor gave way beneath him.

● The next seconds were confusion. A writhing mass of men fell struggling sideways, swearing as they tried to disentangle themselves. Angus' pistol was knocked from his hand by the fall, but he staggered to his feet, still

clutching the knife. The light on his chest remained unbroken, but it was obscured by the struggling bodies. The man next to him suddenly grabbed his arm. Angus tottered and lost his balance. He tripped over a prostrate form, and slid, head first, down a polished stone slope at prodigious speed. After a few breathtaking moments he sped from a kind of chute into a room crammed with the grey Batrachs.

The trap had been well planned. Half a dozen of them flung themselves upon him before he could rise. His knife arm was pinned to his side and despite all the extra power which the low gravitation gave him, he could not break their tenacious holds. Struggling and shrouded beneath the great wings, he could see little, but he was aware that others of his band were suffering a similar fate as they shot into the room. He could hear their muffled curses and grunts as they fought.

With a colossal heave he achieved a sitting position and struggled thence to his feet. The Batrachs still clung about him, pinioning his arms. By jerky, intermittent beams he could see all over the floor a series of struggling heaps with wings threshing furiously above as the men were secured and weighted down by numbers. He tried with all the force of desperation to wrench his right arm free, and bellowed futilely at his assailants:

"You lot of lousy sons of Satan. Just you wait till I get this knife free—I'll show you who's boss here. I'll carve your miserable, stringy carcasses into mincemeat, you—"

But the thin arms twined around him like ropes; not an inch did they give before all his violence. In the far corner he glimpsed Joe Seely rise for a moment, only to be dragged desperately down. The outlook was becoming ngly.

An interruption occurred. A grey curtain on the opposite wall—made, he suspected from wing membrane—was twitched aside. In the doorway behind stood the short figure of Sen-Su. The Martian's clothes had been torn away, and the blood streamed down his brown skin from a dozen ragged cuts. In one hand he held a jagged ended metal bar. His expression was one of dismay until he saw Angus, upright, though helpless. His bullet head went down. He crouched, whirling the bar before him like a lethal flail, and launched forward in a mighty leap at the group which held the engineer. His crude weapon tore through the great wings as though they had been rotten cloth.

The Batrachs' thin bones snapped like sticks as his blows went home. The onslaught was more than they could stand; the hold on Augus loosened. They and others with them flung themselves upon the threshing demon, smothering him in their wings, twisting their long arms about him to bring him, still fighting to the ground.

But Angus broke free. His long knife darted with a shimmer like lightning, slashing, thrusting, tearing about him. Those whom the blade touched sank to the floor; those whom it did not, backed from his neighborhood. Chaos broke loose. The Batrachs holding other prisoners were trodden under the feet of their own kind in flight before Angus. Their grips slipped and the prone men snatched for their knives. Within a few seconds there were five at Angus' side, driving the grey ranks headlong with a line of slicing steel. The din of piercing cries increased as more and more men rose until all were on their feet. The surviving Batrachs fought each other to escape through the narrow doorway. A bellow of rage came from Angus. One of the escaping horde had hooked his sharp wing talon into the flesh of Sen-Su's shoulder and was dragging him away. Angus leapt in and slashed; slashed once and the wing was severed; slashed again and the head rolled away. He picked up Sen-Su and carried him aside. The Martian smiled faintly at his rescuer, then, swiftly, his expression changed. He pointed through the doorway.

"The others," he cried. "Quickly, before they get them away."

Leaving a half dozen men to guard the few Batrach prisoners, Angus and the rest sped down the corridor. From somewhere ahead came the shrill sounds of Batrachs mingled with the confused babble of human voices. The next turn revealed winged figures fumbling frantically at the locks of barred gates set in side walls. They twisted around and emitted high cries as they saw the running men. One glance was enough to assure them that safety lay in flight. With mournful shrieks they disappeared into the blackness ahead.

* * * * *

● A pistol made short work of the locks on the cell gates.

As the imprisoned Martians filed out, Angus caught sight of two familiar, lighter faces.

"David, Cleary," he called. He greeted them excitedly and at once dragged the doctor off to have a look at Sen-Su's wounds.

"He's game," he said. "If he hadn't managed to break out of his cell and take a bit of the bars with him, we'd all be in cells by now."

"Where are the rest?" he asked David as Cleary made his examination.

David looked puzzled.

"I mean the six men who were taken when you were."

It was the first David had heard of them, and he said as much. Angus frowned.

"Then we'll have to go on—we can't leave the poor devils here."

"There are more than those six," said David. He told briefly of the *Red Glory* survivors and the others they had seen on the lower levels. Angus' frown grew still deeper as he listened. It was not a pleasant thought that Earth men and women were existing here as slaves. He was at something of a loss to know how to proceed. Not only would it be difficult to find the way into these further tunnels, but there was no telling what further tricks the Batrachs might have in store.

"See if you can get anything out of the prisoners," David suggested at length. "They might be—er—persuaded to talk."

Angus stared.

"You mean that they *can* talk? Those things?"

"I was told that some of them can—it's worth trying."

One of the prisoners readily admitted to a knowledge of English. Was, in fact fluent from long association with the slaves. His extremely high-pitched voice had a fraying effect on the nerves and he met with difficulties in the forms of labials, nevertheless, he was intelligible.

His information caused Angus to make a complete reassortment of ideas. Hitherto, he had considered the Batachs as he would a species of wild animal—intelligent animals up to a point, but undisciplined; governed by no other instinct than that of the herd. But the view he was now given of them as a race under central authority, pulling together towards an ideal, killed all his preconcep-

tions stone dead. He began to see, for instance, that the piles of dead on the sight of the Martian camp represented not stupid ferocity, but determination and sacrifice. The Batrachs did not go into battle from sheer fighting instinct, but with a clear knowledge that many of their kind must fall for the eventual good of the race.

As one of his theories after another was tumbled down, it became clearer that he must take an entirely different course. He began to think of them as Bat-men, no longer as animals, a mental attitude which was the harder to adopt since hitherto no forms of life in the whole system had even competed intelligently with man. But there was one idea which underwent no readjustment—the Batrachs, whatever their status, must not be allowed to keep Earth men and women as slaves.

Angus considered deeply.

With the rescued Martians and David and the doctor they numbered now one hundred and eight. Not a nugatory party, but certainly not formidable. In addition there was some shortage of arms and several men had been badly mauled. In continued skirmishes with groups of Batrachs their resistance would soon be worn down. Clearly a policy of guerilla warfare was unsuitable. He turned back to the prisoner.

"You talked about government. What form of government is this?"

Apparently there was an official council. The Batrach began to explain with some pride how it was formed. Angus cut him short.

"Take us to this council," he ordered.

The Batrach agreed with an alacrity which caused him secret misgivings. He did his best to shake them off. After all, as he pointed out to David, whatever happened, it could scarcely make their position any worse.

CHAPTER IX

Before the Council

● The Council Chamber, to which their guide led them, proved to be a cave of medium size, but sufficiently large to contain all the party. Word of their coming evidently preceded them, for they found a row of the creatures waiting; fifteen grey Batrachs who watched their arrival with calm, interested eyes. They sat upon a kind of stone shelf, seven to each side of one who was raised a little higher. It worried Angus a little that they showed no trace of fear, nor even anxiety, but, without delay, he plunged into the heart of the matter, addressing the central figure.

"We understand that you are holding a number of men and women of Earth prisoners here?"

The other studied Angus unhurriedly. When he answered, it was in a voice of lower pitch than their prisoner's, but still unpleasantly shrill.

"We are," he said briefly.

"And we demand that you free them at once."

"You 'demand?'" The Batrach showed a tinge of surprize at the choice of words. David and Joe exchanged glances. Both would have favored a less outspoken policy. The party was scarcely in a position to "demand" anything. But Angus merely nodded.

The Batrach forbore to point out that they were virtually prisoners themselves. He asked:

"And why do you think we would surrender prisoners to you who are useful to us?"

"Because you would stand a very poor chance of success against a warship from Earth."

The Batrach considered.

"But if we imprison you, Earth may never know."

There was an uneasy stir among most of the Martians and Earthmen present, but Angus smiled.

"That," he said triumphantly, "is where you are mistaken. You have held the passengers from the *Red Glory* only because we did not know what had become of them. We thought that the ship had been destroyed. Had we even suspected the true state of affairs, you would have had a visit from a warship long ago.

"Now, however, the case is altered. The *Argenta* is undamaged. If we fail to return, someone will take her back to Earth and report. Should you manage to prevent this, the delay will only be slight for our destination was known to officials at home and they will shortly send out a searching party."

His words evidently went home to the council. They started to speak in their shrill, wailing tones. The central Batrach quieted them.

"It would mean the end for many of us," he admitted, "but I doubt even your people's power to conquer and hold all our passages and caves. It would, in fact, be better for them not to try. We could trap party after party so that they would starve. We know your weapons and we know their limitations."

Angus shook his head.

"You know only a few of our weapons." He went on to describe in some detail the effects of some poison gases, and to tell how the heavier types could be poured into the tunnel mouths to percolate throughout the Batrach warrens and kill any who got so much as a sniff of them.

Dissension followed. A few of the Batrachs took his statement for a fairy tale, others who had heard of gases from the slaves, knew better.

"But the prisoners—your own people—they would die too," one objected.

Angus drew himself up.

"It is better," he bluffed, "for an Earth man to be dead than to be a slave. Our men would not wish to kill their own kind, but they would do it sooner than know that they lingered in servitude."

He watched anxiously to see how this piece of heroics would be received. If it failed, he must change his tactics entirely. During the discussion which followed he kept his gaze level and steadfast. At length the spokesman addressed him again.

"We will agree to your demands. The survivors from the *Red Glory* shall go free."

● Angus allowed himself to relax slightly, but before he could reply, David was whispering in his ear.

"The others," he was saying "the younger ones. Don't forget them."

At the suggestion that these also were included in his demand, a great screeching of objections arose from the council. Again the spokesman quieted the rest with a wave of his winged arm.

"They are the children and the grandchildren of the others," he said. "We call them the New Generations. They have never been on the surface. They know only these caves which are their homes—it would not be kind to them to take them with you."

Augus and his party stared. "Would not be kind?"

The effrontery of it. Would not be kind to take them into the sunlight—out of this gloomy labyrinth. He grew angry and his demands became eloquent. The Batrach listened patiently with a look in his eyes almost as though he were secretly amused. Once he began to break in with an objection. Angus swept on, brushing it aside unheard. At last he stopped. The spokesman, still with the disconcerting light in his eyes, hesitated and then gave in.

"We will agree not to stand in the way of their going," he allowed.

Angus had won, but he was not easy. In the middle of his victory he was aware of a twinge of that same misgiving he had experienced earlier in the passages. Again it seemed too simple, and there was a something in the Batrach's tone . . .

* * * * *

The mixed party of Earthmen and Martians was conducted to a large cave to await the coming of the slaves. A few were jubilant and confident. Man, in their estimation had triumphed again, as man always would. But the majority was alert. Like Angus they felt that all was not so cut and dried as it appeared. There was a sense if not of treachery, at least of something very like it, in the air.

A group comprising Angus, David, Joe, Torrence, the doctor and Sen-Su—the latter bandaged, but not seriously hurt—stood apart from the rest, discussing the possibilities of the situation in undertones. Torrence was emphatically of the opinion that the Batrachs were not fetching the prisoners, but mustering for a mass attack with the intention of wiping out all in the cave.

Augus did not agree. For one thing he trusted the chief Batrach's word, and, for another, his threats of invasion from Earth had made a deep impression. All speculation was cut short by the arrival of a party of persons at the near end of the cave. One look showed David the people with whom he had recently talked.

"The *Red Glory* survivors," he said.

The pitiful procession came slowly toward them. John Fordham walked a little ahead of the rest. There was no joy in his bearing; his feelings seemed too deep for that. He approached them, shuffling and tired, his shoulders bent as though they still supported his basket of ore. He looked at them with eyes which seemed to doubt what they saw. His voice quivered and broke as he asked:

"Is it true, what they told us? Are we really going 'Outside'?"

"Yes," Angus told him gently. "It's quite true. We're taking you home."

"Home." The old man stood quite still. His arms hung slackly by his sides. His head went back as though he gazed beyond the rock about him, beyond the millions of miles of space, towards a swinging planet which was home. His breath caught in his throat. He buried his face in his hands and wept.

A woman came to David and plucked at his sleeve.

"And the children?" she asked in a low tone. "The New Generation?"

"They're coming too," he assured her.

● She received the answer in silence. Drew a breath as though to speak. Shrugged her shoulders hopelessly and turned from him to join the others. There was no joy in her manner as she imparted the news. David almost followed her to ask questions, but remembered in time how his last question of the kind had been treated. He decided to wait for this puzzle to solve itself.

Up the far end of the cave another disturbance was occurring and he turned in company with the rest to discover that the New Generations were entering. Exclamations of surprise broke from both Earthmen and Martians as the stream of young men and women and children filed in. Nobody had thought to consider the probable number of the children and childrens' children.

Angus had guessed at a possible hundred or so. Suddenly confronted with more than five hundred, he stared with widening eyes. Even David and the doctor though somewhat prepared were taken aback. Cleary indulged in some hurried mental arithmetic.

The newcomers, accompanied by several Batrachs, remained crowded together at the end of the cave. Most kept their gazes averted, though a few examined Angus and his party with a kind of furtive interest. Their communal attitude was one of puzzled indecision. A short discussion resulted in one man detaching himself. As he approached, David recognized the firm step and fine carriage of their late guide. At a distance of two yards from the group he stopped short, scanning them with a look of distaste. He spoke in the tone of one accustomed to lead.

"You are from 'Outside'?"

Again that curious treatment of the final word.

"We are," Angus replied.

"What do you want here?"

Angus' eyebrows rose. This was scarcely the expected attitude of rescued towards rescuers.

"We have come to set you free."

"Free?" The young man was puzzled. "I don't understand you. We are free."

There was a puzzled silence. Angus supplemented:

"We have a ship on which to take you, and your parents, back to your native planet—Earth."

The young man continued to look mystified for a while. Then a thought appeared to strike him. With a look of growing, indignant horror in his eyes he asked:

"You want us to go 'Outside'?"

"Of course," said Angus curtly. He did not care for the young man's expression.

There was a muttering among the listening crowd of the New Generation. Partly nervous, but in greater part indignant. They shrank back towards the tunnel through which they had entered.

"Look," whispered the doctor to David, pointing towards the group of original survivors. Most of the women were staring towards the New Generations with a complex expression. David analyzed it as mingled yearning and hopelessness. He became aware that the groups of emotions in all parts of that cave fitted with none of his expectations.

"What is it?" He whispered back. "I'm all at sea."

Cleary shook his head.

"I think I'm getting it, but I'm not sure yet."

Meanwhile, on the young man's face, anger replaced consternation.

"How dare you make such a suggestion?" he demanded. "No doubt you think that by those—" he pointed at Angus' weapons "—that you can force us. It may surprise you to know that you underrate us—we are not cowards. Get back to your filth. Get back to your 'Outside'. I am ashamed that our women have been allowed here to hear

such an infamous, indecent suggestion. Had I known that they were to be exposed to such ignominy as this I would—"

Angus stepped forward, eyes narrowed. The young man recoiled; not from fear, but as though he avoided contamination. He turned round and addressing the crowd of the New Generation, already moving to the tunnel.

"Go!" he shouted. "Go before the evil from outside can touch you."

He wheeled back to face Angus. His countenance was a study in abhorrence, but he stood his ground, warding off the other from his people. Angus advanced slowly, bewildered. He put out his hand to press the other aside. The young man gave a cry of disgust, tore off the garment Angus had touched as though it were unclean, and hurled it from him. A loathsome reptile might have inspired the look which now dwelt in his eyes. A quick glance showed him that the last of his people were leaving. Without another word he turned and strode after them.

The silence of consternation held the cave. One voice rose at last to break it; John Fordham's.

"My son," he cried. "My son."

But the retreating figure marched into the tunnel with never a backward glance.

CHAPTER X

The Power of the Batrachs

● Angus broke his trance of astonishment. Several of the *Red Glory* women had begun to sob desolately, hopelessly. He called Sen-Su to his side. Looking into his eyes he said:

"Sen-Su, can we work together?"

The Martian smiled slightly.

"Because I asked that question, they condemned me to exile. My whole faith has been that men should work together instead of exploiting one another."

"And so they shall, by the Lord. We Earthmen have been a pack of fools—you've convinced me of that, Sen-Su. Henceforth, I'm with you Martians. When we get back to Earth—"

"But now we are still on Asperus," Sen-Su pointed out. "What do you wish me to do?"

"I want you to tell some of your men to take these *Red Glory* people to the surface, and to the ship. I'll send some of mine along too, to explain to old Jamie that it's on the level. Will they do that?"

Sen-Su nodded and turned to address his men in lilting Martian. A number of them crossed over and posted themselves beside the rescued.

"And the rest of us?" he inquired, turning back.

"The rest of us are going to get the New Generations out of this warren, whether they like it or not," snapped Angus.

"You'll never do it," Cleary prophesied quietly.

Angus glared.

"Who says?"

"I do. You don't know what you're up against."

"I know that these damned Batrachs are holding them somehow."

"I doubt it: I don't believe that the Batrachs could persuade them to go. They've been clever; they've hit mankind in his weakest spot. Damned clever."

Angus shrugged his shoulders and went about directing the departure of the rest. The survivors at length trailed away, a weary, dejected lot. Some seemed half afraid to leave their prison. Twenty-five years is a long time, and their children had refused to go . . .

As the last of them disappeared a company of grey forms flew out of a large tunnel and up the cave. Angus' hand flew to his knife and then dropped as he recognized the Batrachs of the Council. The creatures alighted a few yards away and closed their wings. The leader advanced.

"They would not go?" he asked Angus.

"You knew damn well they wouldn't go. What I want to know is, why wouldn't they go? How did you stop them?"

"We did not stop them. They could have gone had they wished."

"You did not hypnotize them? They were free?"

This time the Batrach really smiled.

"Freedom. How often have I heard the slaves speak of it?—It is the obsession of your race. What is freedom?"

It occurred to Angus that this was not the simple question it sounded. He wrestled with it awkwardly:

"The power to do as you want."

"Then the New Generations are indeed free."

Angus gave it up.

"I don't believe you," he said bluntly.

"Nevertheless, it is true. If you took the New Generations away by force—as perhaps you might—you would take them from happiness to misery."

"I don't believe that, either. How can they be happy down here in these burrows?"

"You don't appreciate your own point. 'Freedom is the power to do as you want.'—Has it not occurred to you that the 'want' might be suggested?"

● Angus frowned. Someone else had lately spoken of suggestion. Yes, Sen-Su had referred to it as one of the great forces. He looked at the Martian and saw comprehension dawning in his eyes.

"Come," said the Batrach. "Words won't convince you. I must show you why the New Generations will stay."

He turned and led the way up an ascending passage. As he went he talked, giving them what was in effect an amplification of Fordham's explanation to David. The Batrachs, he reiterated, were making a great bid for the future of their race. They had knowledge, but they could not make even so simple a thing as a book to store that knowledge for the benefit of future generations. The Batrach held up his clumsy wing claw. What, he asked them, could be accomplished with so crude an instrument as that? They had tried always to educate the claw, but it was little use compared with even an uneducated hand with the advantage of the power to grip. They had been forced to turn to other methods.

"Just so, I am told," he said, "did your ancestors turn to the horse and to other animals to overcome some of their own limitations. Did you ever think of your horses as slaves?"

Doctor Cleary diverted the subject with a question.

"How did you Batrachs get here—there are no others that we know of in the system?"

"I can't tell you that," the other admitted. "There are legends, but they are vague. They tell of the Mother of all Batrachs, so great, so magnificent in her wings, that she could fly not merely as we fly, but out to the furthest stars in the sky. Now and again, however, even she tired

and needed to rest, and on each world where she rested, she brought forth ten small Batrachs such as we. You can make what you like of that. It may be that the Mother was in reality, a space ship such as yours. I do not know. One thing is certain, and that is that we are admirably adapted to Asperus. We should be unable to fly on even the smallest of the major planets."

"There is usually a basis of truth in such legends," agreed the doctor. He was determined to protect as long as possible his theory of systematic species. He went on to question the other on his physical structure.

The rest of the men followed in silence as the two conversed. David and Joe felt little more than a curious interest in what the Batrach would reveal. Angus wore a puzzled frown. Torrence, as usual, was out of temper. He had abandoned the making of suggestions, but he knew what a man's attitude should be towards an inferior race. This meeting on an equal footing was, to him, not only improper, but weak. Sen-Su was paying close attention to the leading Batrach's talk, while the rest of the Council seemed to be content to bring up the rear.

At last came the glimmer of daylight far ahead. The Batrach led on without a pause. The Doctor, watching him closely, saw that his eyes filmed over with a protective membrane as the light grew more intense. The passage rapidly broadened out until it became a wide cave with an extensive view over valleys and crags. On the rocky floor twenty or more children were playing with simple toys. In careful attendance lurked the figures of tall, grey, female Batrachs. Evidently this was the nursery of the grandchildren of the *Red Glory* survivors. David, mindful of his earlier experience, hung back, but Angus continued. A child noticed his coming and fled with a yelp of terror in the direction of the nearest Batrach. There was an indignant murmur from Torrence that the children were being taught to hate their own kind. He was surprised when the leader calmly nodded:

"But only those from 'Outside'," the latter added.

"I don't see—" Angus began.

The Batrach checked him. "Watch," he said.

● He indicated a small boy who was near the cave mouth.

Outside, the sunlight was pouring down on a broad, smooth ledge. The contrasting world beyond seemed to intrigue the youngster. He was slowly edging towards the fascinating line of light. Once he looked back cautiously toward the other children and their attendants, but they gave no sign of noticing his maneuvers. He crawled on to within six inches of the line of shadow and hesitated again. Finally he made up his mind and boldly stepped over. There was a sudden, ear-splitting crash from a metal gong. A breath of nauseating stench seemed to invade the cave. A child jumped back howling with terror. One of the female Batrachs swept forward and picked him up in a fold of her wing. He hid his face with its streaming tears in the comforting darkness it afforded.

"Behaviorism," cried the Doctor. "A pure Behaviorist method."

Angus' eyes were blazing with anger. He advanced upon the Batrach as though he would strike him.

"It's cruelty," he shouted. "Pure, wanton torture of these children. I see it all now. You've brought up the New Generations to be so scared of you that they daren't do a thing you might resent. You had only to tell them that you wished them to say, and they cringingly obeyed."

Cleary intervened. "Don't be a fool man. Did the leader, old Fordham's son, cringe? Of course he didn't. He walked like a ruler. Besides, these children don't hate the Batrachs. Look there."

The female Batrach, in a motherly way had dispelled all the child's terror. He was clinging to her and almost laughing again. Angus and the others stared in bewilderment. There was no cruelty in the soft eyes with which she looked at the child—only concern that it should be happy once more. Torrence, in the background, muttered vengeful threats.

"I'm damned if I get this," Angus said. "First she allows the child to be terrified out of its wits—then she's really worried when it is. What's it all for?"

"It's on the Behaviorist basis," said the doctor, enthusiastically. "A matter of conditioned reflexes."

"That's all Greek to me."

"You know what a reflex action is?"

"One that is instinctive."

"Not quite that. One that takes place without conscious thought—not quite the same thing. An instinctive reaction is innate, but a reflex action is caused by subconscious memory."

"That seems pretty much the same."

"No, it's not. Take our avoidance of fire. Very young children are attracted by the brightness of fire. They want to play with it—have no instinct to fear it. But you and I do not try to handle fire, in fact, we avoid coming into contact with it. But we don't say to ourselves each time, 'This is fire—I must avoid it.' The warning is subconscious—we 'automatically' avoid it. In other words, sometime in the past we burned ourselves and stored up the subconscious memory that fire was painful.

"A conditioned reflex arose—it caused us to avoid anything in a condition of fire. It was the same with foods; some we 'automatically' leave alone because we know they will make us ill. The same with all kinds of things. As a result we dislike even the smell or taste of them. Once you cut yourself on a sharp knife—now you 'automatically' pick a knife up by the handle."

"Then this . . . .?" asked Angus, indicating the children.

"All the children here will grow up hating the world outside, and that hatred, properly fostered will become an inhibition. They will not be able to leave these caves. The memory of that gong and the nauseating smell won't remain conscious for long, but, if the treatment is continued (as, no doubt it is) the idea that 'Outside' must be avoided will persist. From the behavior of the adults it would appear most successful."

"Do you mean to tell me that if I, as a child, had been treated in this way, I should hate the 'Outside'?" demanded Angus.

"Certainly—why should you be different?"

"But—but I'm free. I can think for myself."

"You think you can—but can you really? Every thought of yours is based on somebody's teaching, or a scrap of information picked up from somebody else. One might even say that there is no 'you'—you are no more than a conglomeration of bits of other people. It's true," he added as Angus shook his head, "think it over a bit. You are as much a product of conditions as these children will be.

"Given a completely uninstructed child, a blank canvas, so to speak, there is scarcely any code of belief, mor-

als or behavior which cannot be induced by careful training. You've only got to look at the violently differing codes upon Earth to see that.

"That's what the Batrach meant when he asked you what was freedom. We are always prompted or guided by others whether we like it, or not. Sen-Su said that suggestion was all powerful. He was right. This is its most subtle application."

CHAPTER XI

The Altar

● There was a pause while all the men regarded the children in silence. The idea was slowly sinking into Angus' reluctant mind. Was it possible, he was wondering, to warp minds so that they saw nothing but horror in the fresh greenness of trees; so that the sun ceased to be the life giver, but became something indecent and fearful, never to be looked upon? It seemed impossible, and yet . . . .

David, too, was thinking. He remembered the decorations in the caves of the New Generations—not a natural form had been allowed to intrude. Every suggestion of the world "Outside" had been rigidly excluded. He remembered, too, the expressions he had faced—hate, fear and disgust . . .

Torrence was not thinking. This foolery was taxing both his patience and his control. It was no mean task to keep his tongue still.

Again a child was approaching the line of sunlight. They watched in silence an exact repetition of the earlier episode.

"But why the gong?" asked Joe. "Why not stop them each time?"

"That is simple," the Batrach explained. "Were we to stop them, they would resent it and end by disliking us—as it is, we comfort them after their fright and they love us for it."

Joe's mouth opened wide. He had never considered the possibility of anyone loving a Batrach.

"Come," the tall, grey figure added. "I will show you one more piece of the life of the New Generations. I think it will convince you."

He led the way back into the tunnel. The doctor hurried forward and walked abreast with him.

"Then you do not mind the *Red Glory* survivors leaving?" he asked.

"No. We could only get the coarsest of compulsory labor from them. It was their children we wanted. We had, at first," he added, "some difficulty in persuading them to bear."

He went on to explain. The survivors' children had been taken from their parents as soon as possible and started on an elaborate course of conditioning to environment. Success had been immediate and the New Generation had been brought up thinking, feeling, acting and reacting in the ways the Batrachs wished—yet unaware of any compulsion. When the second generation began to appear it could be safely left with its parents save for regular periods of training in a nursery such as they had seen. The change was really very slight, he pointed out, none of the basic instincts was touched and character remained unaltered—only certain taboos became desirables, and certain desirables, taboo.

The doctor nodded thoughtfully.

"And so," he said. "Our strongest point is our weakest."

The Batrach was puzzled.

"I mean, our adaptability. It is that power which takes us into dry climates and wet, tropics and polar regions, cold planets and hot planets, open spaces and confined quarters—has, in fact, taken us all over the system. You have succeeded in turning that same adaptability to your own advantage.

"The others do not understand how the New Generations can be really happy in here, but I do. There never was (in this system, at least) a race so adaptable as we."

The Batrach checked at last at a small doorway. Making a sign for silence, he led the way within.

They emerged upon a shelf partway up the wall of a large cavern. In the arrangement of the place there was more than a suggestion of the interior of a church. Row upon row the New Generations sat below them all gazing intently towards the far end at a feature which caused the Earthmen to stiffen with surprise. A long table stretched right across the cave and was covered by a cloth decorated with metal thread. The ornaments which rested upon it gave it the appearance of a kind of altar. Behind, outspread so that they covered most of the end wall, was a pair of wings patterned after those of the Batrachs. They had been skilfully fashioned from grey, lustrous metal which gleamed under an ingenious arrangement of the dim lights. Below them a man dressed in a grey tunic was in the act of mounting a few steps which led to a kind of rostrum.

He reached the platform and stood for a moment with his back to the audience gazing up at the great wings above him. Then he turned and began to speak in a calm, clear voice. His pale face was serious and there was no doubting the sincerity and strength of the belief which backed his words. But what words they were . . . The men's eyes grew wide as they listened.

"—Our ancestors sinned. They doubted, and doubt is sin. For that sin they were punished. They were cast into the nethermost 'Outside'—a place of evil and terrors without names. They forfeited all; they had betrayed their faith and, as a punishment, their wings" —he dropped his voice as though grieving—"were withered upon them. Shorter and shorter grew their arms, and less, generation by generation, the spread of their wings until, at last, the membrane was gone and they were left as we are with but stunted growths."

In a gesture he held out a pair of magnificent arms and stared at them.

"These," he stretched them out towards the audience, "these are the symbols of our fall; the badge of our shame.

"But,"—his voice rose triumphantly—"through faith we shall win back. Beyond hope—damned through all eternity—are those 'Outside'. But our feet are already upon the road back. The Batrachs have taken us in and purified us. Here in the caverns of the chosen they have taken compassion upon us. We shall climb again to that high estate from which our ancestors fell.

"Slowly and surely we shall rise, scaling the firm rungs of faith. It will not come in our time, nor even in our children's time, for the return to grace is hard, but far, far in the future, men who have regained their lost wings—such wings as the Batrachs have—will look back upon us and praise us for our faith which paved the way. Therefore, I tell you, keep faith. Firm, steady and unfaltering faith so that a million yet to be born may one day

look back and honor you. Imagine a man in the full glory of his restored wings who will whisper the name of one of you, saying: 'She was my mother, and faith, my cradle.' "

As the last words died away he turned to face again the huge, symbolic wings upon the wall. He raised his arms imploringly and stood motionless. There was not a sound to be heard in the cave.

On the ledge the men stood speechless, astounded by the travesty. There had been no bluffing. They caught the spirit of the men and women below. Intense, faithful, trusting, and, above all, convinced. That the Batrachs had taught this religion and the worship of the Wing, there could be no doubt—but that it had become a part of the worshippers' lives, there was equally little doubt. So simple.

A slightly new twist to the old Earth legend of angels, and there was the ideal, with the Batrachs already in the position of demi-gods. David remembered John Fordham's words—"The Batrachs can think, but they cannot *do*." He had been right. They had thought a new race of mankind into being, and this race, regarding them as saviors, would work for them willingly and joyfully, secure in their faith. David's last hope died; the New Generations could never be rescued against such odds.

Torrence broke the silence with a shout. He swung himself over the edge of the rock shelf and dropped to the floor below. Before any could stop him he was on his feet and racing toward the far end. He leapt upon the rostrum and felled the speaker with a blow.

"Fools!" he shouted, swinging round on the startled audience. "Fools! He lied to you. Nothing but lies. It's a plot of the Batrachs. Men never had wings—they never will have wings. They—"

"Blasphemer," roared a voice. An echoing pandemonium broke loose, drowning Torrence's voice with its babel.

The audience rose to its feet. With murder in its eyes, it charged madly towards the rostrum.

Angus knew an infuriated mob when he saw one.

"My God, they'll lynch him," he cried.

The Batrach beside him swooped down from the ledge and spread his wings; another followed his lead. Together they sped towards the lone figure of Torrence, at bay beneath the monstrous metal wings. Their talons snatched him up and lifted his struggling figure clear of the crowd just in time. A moment later they brought him back, pale and not a little scared, to the ledge. The Batrach, after a glance at the outraged worshippers on the floor below, led the way into the corridor. There, he turned and looked at them with eyes which held the faintest tinge of mockery.

"You are convinced?"

Angus nodded unhappily.

"You're devils, but you're clever devils."

"And you will leave us in peace?"

"What else can we do?" Angus shrugged.

"You might gas us," observed the Batrach with an inflection which called the bluff.

"All right. You win," admitted Angus miserably.

"Goodbye," said the Batrach.

As they took an uphill tunnel, Angus turned to the doctor.

"And you really think they're happy here?" he asked.

"Less unhappy than they'd be anywhere else," was the reply, "and what more can you wish any man?"

Sen-Su's lilting Martian voice joined in:

"And now?"

"And now," responded Angus, "we go back to Earth to preach the brotherhood of man and the damnation of Batrachs."

And so, though it is colonized, you will fail to find the word "Asperus" on Earth's proud colonial lists.

THE END.

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Interplanetary Bridges

(Continued from page 165)

in which I found them. They cover a period of one year:

Jan. 1. Martin departs for Buenos Aires to buy up the controlling stock of a South American mining company in bankruptcy. The company is to be used as an outlet for the diamonds brought from Venus.

Feb. 15. A large ship has been completed. We begin the transfer to our islands in the South Sea.

Feb. 28. A large ship arrives at the island with two shiploads of varium sand from Kamchatka. The material was shipped on two of Martin's freighters and loaded onto the airship at sea. We shall have to repeat this mode of transportation several times. There is enough material for a forty thousand ton space ship and a smaller one the size of the *Astraea*.

March 12. Martin and Meixner make a trip to Europe aboard the *Astraea*. Near Vienna, a confrère has offered his estate and park for the *Astraea*. A number of Austrian scientists are taken to the island in the South Sea. They are: Professor Wagner, a botanist of continental renown and a student of Hofrat Wiesner. The latter will open an institute for plant physiology on the island; Dozent Kraus, the foremost German expert on tropical plants, who has spent twenty-five years of his life in the tropics; Dozent Doktor Krueger from the Institute of Pharmacology, well known amongst his colleagues for his knowledge of plant poisons and their chemical and biological reactions; the physicist, Wilhelm; and lastly, Dr. Bauer, expert chemical engineer. All are enthusiastic over their mission.

On the return trip, between Malta and Alexandria, an encounter with a French battleship. Martin displays the German war flag, cripples the propeller, and flees.

April 1. The hard plates of Venusian crustacea are adaptable to use as leather through a system worked out by Dr. Bauer.

June 1. Terrestrial insects, worms, especially earth worms are getting along well on our samples of Venus soil. Plants of our tropical plains are also adaptable to this kind of soil. We have decided to take along to Venus many eggs of terrestrial insects, several bee-hives, and an aquarium of terrestrial salt and fresh water organisms. We have made provisions for equipping the new giant ship with suitable chambers for that purpose.

June 10. I spent a few days with Taussig, Rhaden, Mrs. Rhaden, my wife, in outer space on board the *Astraea*. The floor window was altered as previously suggested. Paid a visit to the moon. Started at night and arrived on the dark side of the moon. We had no trouble with solar radiation, although we left the earth's shadow after one hour. No symptom's of Meniere's disease. The absence of a lunar atmosphere made us decide against landing. We approached the moon to a distance of six miles, the high mountains forbidding closer approach. We could discern countless details undetected from the earth. We circled the moon and saw a great portion of the much flatter, invisible side of the moon. I shall describe the journey later and add photographs.

June 25. Total receipts from marketing our Venus diamonds amount to $120,000,000 so far, representing one-tenth of our stock.

July 1. Investigations by Wagner and Bauer have proved the root tissue of the green "leaves," in a fresh state as well as dried, a well fitted food for humans and ruminants, especially for the later with their high content of carbohydrates. They not only grow on terrestrial soil but displace all other plants. Wagner has discovered that an admixture to the soil of small amounts of calcium sulphate will check their growth to any desirable degree. For that reason, we never encountered them near volcanos on Venus.

July 18. Martin, Taussig, Bauer, and Rhaden were on Mars. High mountain climate even in the plains. Thin atmosphere. Snow and ice formation almost to the equator. Vegetation sparse, plants not green, but white, yellow and brown. Traces of animal life, caves with impressions of cloths or sharp tools, but no Martian inhabitants. Mars canals produced by double refraction of light from the Martian seas. Human life impossible because of the rarified air, the long winter and the impossibility of gaining food for men and animals from the barren soil.

Aug. 1. Blue root bulbs which grow well in the tropical soil of the South Sea proved to be highly valuable, albuminous foods. The giant fungi which furnish a kind of crumbling marrow, grow in a tropical climate to the height of a bungalow. But they grow only in swampy soil which they dry up quickly. After seven months, cracks form in the stems and the wind carries away the pollen. One fungus easily gives the equivalent of considerable good soil. In arid soil they grow only with copious and regular irrigation.

Sept. 1. Three thousand German men, women, and children have settled thus far on our island. We are beginning to select the prospective settlers of Venus.

Oct. 1. In cooperation with Taussig and Meixner, Dr. Wilhelm succeeded in increasing the range of the lethal tubes to 500 feet. With this timely discovery, Martin wanted to give up the colonization of Venus which will probably cost many lives, and begin a war of revenge immediately. Lengthy debates. Taussig convinced all to stick to the idea of colonization of Venus, if only to utilize the varium deposits there. Since terrestrial plants and animals can live on Venus, conditions are not unfavorable to human life. (Here Lindner's notes end.)

About three months after Lindner's departure from my home, the newspapers of the entire world brought reports of wireless signals, pointing to some extra-terrestrial station. Our radiologists related these signals to intelligent, mechanically advanced beings on Mars. The Eiffel Tower and other powerful stations attempted to enter into communications with this remote sender by sending out simple signals on currents of immense power. They hoped that these experiments might start an exchange of communications.

But the cosmos remained silent.

Will it always be?

THE END

THE READER SPEAKS

In WONDER STORIES QUARTERLY only letters that refer to stories published in the QUARTERLY will be printed.

From Rangoon to Mandalay

Editor, Wonder Stories Quarterly:

Will you as a reader allow me to compliment you on the Summer WONDER STORIES QUARTERLY issue, Volume 3, No. 4, which contains absolutely the best pack of stories I have ever read in any one issue of your magazine, particularly the ones written on the winning plots.

I am not writing this for my name to figure in "The Reader Speaks" column and it is not for publication, but merely in appreciation from an Englishman.

I have had this magazine sent out regularly to me ever since my boy showed it to me two years ago; he is now on the Wild Coast of Travancore in Southern Madras, almost opposite Colombo, and I send the magazine over to him regularly, after I have read it, on its arrival from England.

I will certainly keep my eye on Raymond Gallun, John Michel, Laurence Manning, John Bertin and Edward Morris, in fact every one of the authors in this issue. It is a magazine that you should be extremely proud of and should bring you many regular readers.

J. A. Gunn,
Rangoon, India.

(It's good to hear such encouraging words from far-off Rangoon. We would like to hear now from Mr. Gunn's son, of his experiences in Travancore; and what science fiction brings him. Perhaps he experiences things as bizarre as the stories of our authors. Word wanted from Travancore.—*Editor.*)

Excess Adjectives

Editor, Wonder Stories Quarterly:

I received my first QUARTERLY a week or so ago, and I would like to congratulate you on two of the stories.

"Beyond Pluto" was really an excellent story of the "improbable" type—well written and holding the interest to the end.

"The Voyage of the Asteroid" was at the opposite extreme of probability and some day I hope to read such a description in my morning paper. This story was also well written and demonstrates in my opinion, that what counts most is the style and general fluency of writing combined with reasonably accurate detail. No matter how weird and wonderful the incidents, if the style is bad one subconsciously criticises the story from beginning to end.

The "Jovian Horde" is quite a good yarn spoiled by obvious striving after word-effect—it is ludicrous in parts. There is far too much "hoarse merriment" coming from the "grisly female hellions" over the "shrieks, coming in a long ripple of hideous sound" from the "writhing slaves." Half the adjectives could have been omitted from this story with great benefit. Even "the sunset's glory laving the Adirondacks in crimson and gold" could not erase the memory of Lance "chortling savage glee as the blocky, green-eyed, coppery-haired creatures sagged down like grotesque images toppled by a mighty wind."

I admit it is very easy to criticise, and possibly I am somewhat conservative according to standards across the water, but I honestly think that if you could persuade your writers to leave out some of the "flaming" adjectives, their stories would gain greatly in "readability."

"Exiles of Mars," "Rebellion on Venus," and "Menace from Mercury," were average, with "Exiles of Mars" heading the three. "Menace from Mercury" was pointless—an incident leading nowhere.

However "Beyond Pluto" and "The Voyage of the Asteroid" made the

(Continued on Page 190)

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THE READER SPEAKS

(Continued from Page 188)

Summer QUARTERLY well worth while.

Wishing you every success, especially in the suppression of unwanted adjectives. "The Final War" was a good example of a gripping story describing incidents which required superlatives—yet on the whole the writer never overstepped the boundaries between pleasant reading and "journalese."

(Dr.) W. O. Gibson,
Bathgate, West Lothian, Scotland.

(We agree with Dr. Gibson emphatically about excess adjectives. The simpler the style the more effective occasional adjectives become. But a man can become wearied with the most startling of adjectives, if he hears them often enough.—*Editor*)

Astonishment, Awe, Wonder

Editor, Wonder Stories Quarterly:

Well! I should be hanging my head in shame, but I'm going to be brave and "take it!" Some time ago I wrote to this column and, foolishly it seems, used two terms on which you request explication: "fact author," and "super-wonderful."

In the first place, what I meant by "fact author" can be explained thus: all authors produce excellent manuscripts. I settle down comfortably to read one, and when I am finished, yawn, and say "now that was a good story. Mighty interesting." Then, later I stumble across one of Mr. Gallun's tales. When I am through reading it, I scarcely move and say, "That was a masterpiece, an account of very dim and vague realities. It is the kind of story that makes me sit and wonder if such occurrences could be real. It is convincing, scientific, not merely something to amuse the reader. Some don't but I likes 'em that way." You're a "fact" author, Mr. Gallun!

Now "super-wonderful." The dictionary (your Standard Webster will do), states that admiration leads to astonishment; awe is greater than astonishment; bewilderment than awe; confusion and perplexity than bewilderment; surprise than confusion and perplexity, and wonder than them all! Now, super is above, beyond, over; therefore, I made the statement that "though the previous issues of WONDER STORIES QUARTERLY were wonderful, the Winter 1932 was—beyond comprehension." In view of this, am I a candidate for the mad-house so much as before (or more)?

Forgive me, Editor, but I simply must spoil you by the not at all startling news that you have the finest collection of authors I've seen contributing to many, many magazines. During the time I read your publications I have tried to find the good and the bad points of the contributors. I believe it helps to know their respective narratives better. I have found out that they are slipping. Their stories run always along the same lines. Sometimes this is pleasant, but other times it is rather trying. An example of the former, Hilliard; of the latter, any one else—no offense, don't go by my likes and dislikes, which are avid either way! But, what I want is variety, something wholly different from anything so far published, to

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Plate I.	Nude Adult Female
" II.	Nude Adult Male
" III.	Nervous System of Female
" IV.	Skeletal System
" V.	Muscular System (Posterior)
" VI.	Muscular System (Anterior)
" VII.	Vascular System
" VIII.	Respiratory System
" IX.	Digestive System
" X.	Male Genital Organs in Detail
" XI.	Female Genital Organs in Detail
" XII.	Cross Section of Pregnant Female Body with Child

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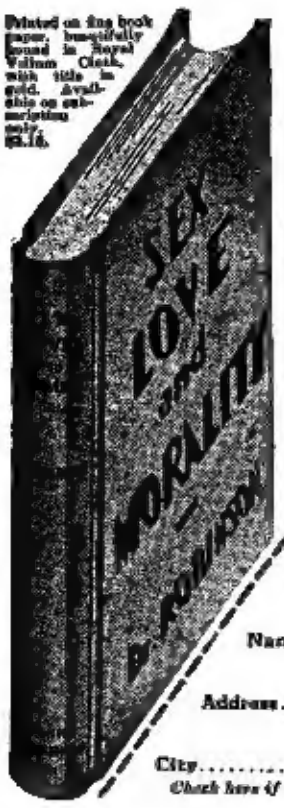

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THE READER SPEAKS

start anew a style of science fiction, for style changes, you know, whereas science doesn't!

Well, regardless, *keep up the good work*, for what is good for any other magazine is no good for WONDER STORIES QUARTERLY!

Virgil C. A. Parnoff,
Bridgeport, Conn.

(Mr. Parnoff does a good job of explaining his super-adjectives. We accept them. We don't blame him for wanting variety. The editors have likes and dislikes too, you must remember. That is why we keep our authors constantly on their toes, getting them to explore the yet unexplored, and to tell us about the mysteries that are still mysterious. That is how we keep interested in life. For editors must live also.—*Editor*)

How Cold Is Space?

Editor, Wonder Stories Quarterly:

The "Voyage of the Asteroid" brought to my attention a matter of space flight which seems to be overlooked by some authors: the problem of keeping a space vessel at a proper temperature.

It is quite easy to keep it warm by burning fuel, but to keep it cool is another matter. On page 522 of the story in question, the author states that the ship became quite warm due to the heat of the sun and this was at the very beginning of the trip. Now in space at a distance from the sun equivalent to the earth's distance, the temperature of a small black body will be about +4°C, which is quite cool. At a point in space near the orbit of Venus the temperature of the same body will be about 53°C. So far as the heat of the sun is concerned, there would be no difficulty until the space ship was about half way to Venus.

In the story, the author regulates the temperature by using a refrigerator. A refrigerator does not produce cold but merely an unequal distribution of heat. In order to cool one part of the ship, it is necessary to heat some other part. The only way for a ship in space to lose heat is by radiation (unless by loss of matter). So the refrigeration system is of no value as far as the ship itself is concerned.

There is one method that can be used successfully, I think, and it consists of making the radiation power of different values on different parts of the shell of the ship. Suppose, for instance, that the ship was spherical and one half was painted with aluminum paint, or any suitable reflecting medium, and the opposite side was painted dull black. The ship could be adjusted in respect to the source of heat so that the rates of radiation and reflection combine to give a suitable temperature inside of the ship. At distances of 100,000,000 miles or more from the sun, with the black side facing the sun, the heat would be absorbed and but little radiated, thus keeping the ship warm.

The combustion of fuel in the rocket tubes offers another problem of temperature: how can the ship be protected against their heat? Here on the Earth we can use unlimited supplies of air or water for cooling purposes and so increase the effective area of radiation (the heat being finally lost by radiation into space). How can we increase the radiation of heat from a space ship and prevent temperature rise when conduction from the rocket tubes is apt to be greater than the radiation from the shell? Obviously, the rocket tubes will have to have some insulating support. This problem will have to be accounted for in the design of a successful space ship.

Some of these data given in this letter are based upon statements given in an article which appeared in the April 1932 *Scientific American:* "How Cold is Space?" The accuracy of the figures as I have given them, is not of a high order but is sufficient for the purpose. I hope that Mr. Manning will feel that this criticism is given in a friendly spirit and that back of it is a desire to see science fiction become better than ever. I enjoyed the story very much and my interest in it prompted this letter.

H. Edgar Coburn,
San Diego, Calif.

(The problems that our correspondent poses are real ones. There is no getting around the fact that they have not yet been solved in theory or practice. However in our stories the imagination of our authors will grapple with these problems and perhaps suggest solutions that engineers in the future will seize upon.—*Editor*)

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of Wonder Stories Quarterly, published Quarterly at Mt. Morris, Ill., for October 1, 1932.

State of New York }
County of New York } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Irving Manheimer, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Wonder Stories Quarterly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Stellar Publishing Co., 404 No. Wesley Ave., Mt. Morris, Ill.; Editor, Hugo Gernsback, 98 Park Place, New York; Managing Editor, David Lasser, 98 Park Place, New York; Business Manager, Irving Manheimer, 98 Park Place, New York.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Stellar Publishing Co., 404 No. Wesley Ave., Mount Morris, Ill.; Hugo Gernsback, 98 Park Place, New York.; Sidney Gernsback, 98 Park Place, New York; D. Manheimer, 98 Park Place, New York.

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I. S. MANHEIMER,
Signature of Business Manager.

Sworn to and subscribed before me this 28th day of Sept., 1932.

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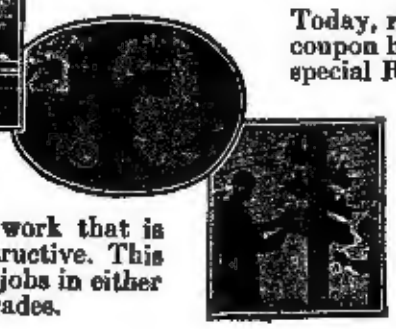

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